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THE ZOOLOGICAL RECORD.



THE
ZOOLOGICAL RECORD

FOR 1889;

BEING
VOLUME THE TWENTY-SIXTH
OF THE
RECORD OF ZOOLOGICAL LITERATURE.

EDITED BY
FRANK E. BEDDARD, M.A., F.Z.S.,
PROSECTOR AND DAVIS LECTURER TO THE ZOOLOGICAL SOCIETY OF LONDON.

Explorate solum : sic fit via certior ultra.

LONDON :
GURNEY & JACKSON, PATERNOSTER ROW.
M.DCCC.XC.



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LONDON :
ED BY SIMMONS & BOTTEN,
3, Shoe Lane, E.C.

P R E F A C E.

THE ZOOLOGICAL RECORD for 1889 has been prepared, under Mr. Beddard's editorship, on nearly the same plan as the previous volume.

The Committee appointed by the Council of this Society to superintend the publication for the year 1890-91, consists of Mr. F. Du Cane Godman, F.R.S., Mr. Henry E. Dresser, Dr. St. George Mivart, F.R.S., Prof. A. Newton, F.R.S., Mr. Osbert Salvin, F.R.S., and the President and Secretary.

As in last year's RECORD, the whole subject has been divided into eighteen sections, of which a list is subjoined. The list gives also the Recorder's name in each case, and the number of pages devoted to the particular subject. A corresponding list of the sections and of the Recorders in the last year's volume is added, so that a comparison may be made between them.

VOL. XXVI.			VOL. XXV.		
Division.	Recorder.	No. of Pages.	Recorder.	No. of Pages.	
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2. MAMMALIA	R. Lydekker	55	R. Lydekker	64	
3. AVES	A. H. Evans	79	A. H. Evans	96	
4. REPTILIA & BATRACHIA	G. A. Boulenger	23	G. A. Boulenger	23	
5. PISCES	G. A. Boulenger	30	G. A. Boulenger	30	
6. TUNICATA	W. A. Herdman	5	W. A. Herdman	5	
7. MOLLUSCA	P. C. Mitchell	85	W. E. Hoyle	82	
8. BRACHIOPODA	O. H. Latter	6	W. E. Hoyle	6	
9. POLYZOA	O. H. Latter	8	W. E. Hoyle	11	
10. CRUSTACEA	C. Warburton	29	C. Warburton	30	
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12. MYRIOPODA	R. Innes Pocock	10	R. Innes Pocock	6	
13. INSECTA	David Sharp	320	David Sharp	327	
14. ECHINODERMATA ...	O. H. Latter	23	O. H. Latter	16	
15. VERMES	P. C. Mitchell	35	P. C. Mitchell	31	
16. COELENTERATA	S. J. Hickson	24	W. E. Hoyle	34	
17. SPONGIÆ	O. H. Latter	10	O. H. Latter	20	
18. PROTOZOA	C. Warburton	16	C. Warburton	22	

It is with great pleasure that, in accordance with the expectations held out in the last volume, the Committee are able to date their Preface three months earlier than that of the preceding one. The Committee wish to express their thanks to the Editor for carrying out so well the arrangements which have led to this desirable result, and for the care and attention which he has bestowed on the volume.

P. L. SCLATER,

Secretary.

ZOOLOGICAL SOCIETY OF LONDON,
3, HANOVER SQUARE, LONDON, W.

1st November, 1890.

EDITOR'S PREFACE.

THE present volume has been prepared by nearly the same staff of Recorders as the volume of last year. Mr. Hoyle, whose appointment to the Curatorship of the Owen's College Museum left him insufficient leisure, has been compelled to withdraw from his task of recording the *Mollusca*, *Brachiopoda*, *Polyzoa*, and *Cæloenterata*. Dr. Hickson has, therefore, kindly furnished the record of *Cæloenterata*, and the three other groups have been undertaken by Mr. Mitchell and Mr. Latter. In calling attention to the fact that Volume xxvi is issued at a considerably earlier date than the last two or three volumes, I desire to thank the Recorders for their assistance in bringing about this desirable result.

FRANK E. BEDDARD.

November 1st, 1890.

LIST OF THE ABBREVIATED TITLES
OF THE PRINCIPAL
JOURNALS AND TRANSACTIONS OF LEARNED SOCIETIES
WHICH CONTAIN ZOOLOGICAL PAPERS.

- A Magyar Akad. Evkön.*—A Magyar tudományos Akadémia évkönyvei.
- Abh. Ak. Berl.*—Abhandlungen der königlich Akademie der Wissenschaften zu Berlin. (Also *SB.*)
- Abh. Bayer. Ak.*—Abhandlungen der mathematisch-physikalischen Classe der k. Bayerischen Akademie der Wissenschaften (Munich). (Also *SB.*)
- Abh. Böhm. Ges.*—Abhandlungen der mathematisch-naturwissenschaftliche Classe der k. Böhmisches Gesellschaft der Wissenschaften (Prague). (Called also *Rozpravy třídy mathematicko-přirodovědecké královské české společnosti nauk.*) (Also *SB.*)
- Abh. Ges. Götting.*—Abhandlungen der k. Gesellschaft der Wissenschaften zu Göttingen.
- Abh. Ges. Halle*—Abhandlungen der naturforschenden Gesellschaft in Halle. (Also *Ber.*)
- Abh. Ges. Hamb.*—Abhandlungen aus dem Gebiete der Naturwissenschaften herausgegeben vom naturw. Verein in Hamburg.
- Abh. Ges. Isis*—Abhandlungen der naturwissenschaftlichen Gesellschaft 'Isis' in Dresden. (See *SB.*)
- Abh. Ges. Königsb.*—Abhandlungen der k. physikalisch-ökonomischen Gesellschaft in Preussen (Königsberg). (Also *SB.*)
- Abh. naturf. Ges. Görlitz*—Abhandlungen der naturforschenden Gesellschaft zu Görlitz.
- **Abh. naturh. Ges. Nürnberg*—Abhandlungen der naturhistorischen Gesellschaft zu Nürnberg. (See *J.B.*)
- Abh. Sächs. Ges.*—Abhandlungen der k. Sächsischen Gesellschaft der Wissenschaften (Leipzig). (Also *Ber.*)
- Abh. Schles. Ges.*—Abhandlungen der Schlesischen Gesellschaft f. vaterländische cultur (Breslau). (Also *JB.*)
- Abh. Schw. pal. Ges.*—Abhandlungen der Schweizerischen paläontographischen Gesellschaft (Bâle).

* Those periodicals marked with an asterisk (*) are no longer published.

- Abh. Senck. Ges.*—Abhandlungen herausgegeben von der Senckenbergischen naturforschenden Gesellschaft (Frankfort). (Also *Ber.*)
- Abh. Ver. Brem.*—Abhandlungen herausgegeben vom naturwissenschaftlichen Verein zu Bremen.
- Abh. zool. Mus. Dresden*—Abhandlungen und Berichte des k. zoologischen, etc., Museums in Dresden.
- Act. Ac. Bordeaux*—Actes de l'Académie nationale des Sciences, Belles Lettres et Arts de Bordeaux.
- Act. Ac. Córdoba*—Actas de la Academia nacional de Ciencias de la republica Argentina en Córdoba (Buenos Ayres).
- Act. Lund.*—Acta Universitatis Lundensis (Lund). (Called also *Lunds Universitets Årsskrift*.)
- Act. Soc. Fenn.*—Acta Societatis Scientiarum Fennicæ (Helsingfors).
- Act. Soc. Helv.*—Actes de la Société Helvétique des Sciences naturelles (Called also *Verhandl. d. schweiz. Naturforsch. Gesells.*)
- Act. Soc. Jura.*—Actes de la Société Jurassienne d'émulation.
- Act. Soc. L. Bord.*—Actes de la Société Linnéenne de Bordeaux. (Also *Comptes rendus*.)
- Act. Upsala.*—Acta Universitatis Upsalensis. (Called also *Upsala Universitets Årsskrift*.)
- Aid*—C. O. Waterhouse's Aid to the Identification of Insects (Janson : London).
- Alb. Nat.*—Album der Natur (Harting : Haarlem).
- Am. Geol.*—The American Geologist (Calvin et alii : Minneapolis).
- Am. J. Sci.*—American Journal of Science and Art. (New Haven.)
- Am. Micr. J.*—American Monthly Microscopical Journal (Hitchcock : Washington).
- Am. Nat.*—American Naturalist (Philadelphia).
- Anat. Anz.*—Anatomische Anzeiger (Bardeleben : Jena).
- An. Mus. B. Aires*—Anales del Museo nacional, Buenos Aires.
- An. Mus. Costa Rica*—Anales del Museo nacional, Republica de Costa Rica (San José).
- An. Mus. La Plata*—Anales del Museo, La Plata (Buenos Ayres).
- An. Mus. nac. Mexico*—Anales del Museo nacional de Mexico.
- An. Soc. Arg.*—Anales de la Sociedad Científica Argentina (Buenos Aires).
- An. Soc. Esp.*—Anales de la Sociedad Española de Historia Natural (Madrid).
- Ann. Acc. aspir. Nat.*—Annali dell' Accademia degli aspiranti Naturalisti (Naples).
- Ann. Ent. Belg.*—Annales de la Société Entomologique de Belgique (Brussels).
- Ann. Geol. univ. Paris*—Annuaire Géologique universel, Revue de Géologie et Paléontologie (Carey & Douvillé).
- Ann. Hofmuseum Wien*—Annalen des k. k. naturhistorischen Hofmuseums (von Hauer : Wien).
- Ann. Lomb. Venet.*—Annali di Scienze del regno Lombardo-Venetiano.
- Ann. Mal.*—Annales de Malacologie (Servain : Paris).
- Ann. Micrograph.*—Annales de Micrographie (Miguel : Paris).

- Ann. Mus. Belg.*—Annales du Musée royal d'Histoire Naturelle Belgique (Brussels).
- Ann. Mus. Genov.*—Annali del Museo civico di Storia Naturale di Genova (Genoa).
- Ann. Mus. Marseille*—Annales du Musée d'Histoire Naturelle de Marseille. Zoologie (Marion : Marseilles).
- Ann. N. H.*—Annals and Magazine of Natural History (London).
- Ann. N. York Ac.*—Annals of the New York Academy of Sciences.
- Ann. Sci. Géol.*—Annales des Sciences Géologiques (Hébert & Milne-Edwards : Paris).
- Ann. Sci. Nat.*—Annales des Sciences Naturelles (Paris).
- Ann. Soc. Agric. Lyon*—Annales de la Société d'Agriculture, Histoire Naturelle, et Arts utiles de Lyon (Lyons & Paris).
- Ann. Soc. Bruz.*—Annales de la Société Scientifique de Bruxelles (Brussels).
- Ann. Soc. Char.*—Annales de la Société des Sciences Naturelles de la Charente Inférieure (= Académie de la Rochelle).
- Ann. Soc. Em. Vosges*—Annales de la Société d'Émulation du Département des Vosges (Epinal).
- Ann. Soc. Ent. Fr.*—Annales de la Société Entomologique de France (Paris).
- Ann. Soc. Géol. Belg.*—Annales de la Société Géologique de Belgique (Liège).
- Ann. Soc. Géol. Nord*—Annales de la Société Géologique du Nord (Lille). (Also *Memoires*.)
- Ann. Soc. L. Lyon (n.s.)*—Annales de la Société Linnéenne de Lyon. Nouvelle série.
- Ann. Soc. Mal. Belg.*—Annales de la Société Malacologique de Belgique (Brussels).
- Ann. Soc. Mod.*—Annuario della Società dei Naturalisti di Modena. (See *Atti*.)
- Ann. Univ. Toscane*—Annali delle Università Toscane (Pisa).
- Ant. Annual*—The Antananarivo Annual and Madagascar Magazine (Sibree : Antananarivo).
- Anz. Ak. Wien*—Anzeiger der mathematisch-naturwissenschaftlichen Classe der k. Akademie der Wissenschaften zu Wien (Vienna).
- Appalachia*—Appalachia : the Journal of the Appalachian Mountain Club. (Boston).
- Arb. Inst. Würzb.*—Arbeiten aus dem zoologisch-zootomischen Institute in Würzburg.
- Arb. z. Inst. Wien*—Arbeiten aus dem zoologischen Institute der Universität Wien (Vienna).
- Arb. z. Inst. Graz*—Arbeiten aus dem zoologischen Institute zu Graz (Leipzig).
- Arch. Anat. Phys.*—Archiv für Anatomie und Physiologie (His, Braune, & Du Bois Reymond : Leipzig).
- Arch. Biol.*—Archives de Biologie (Van Beneden & Van Bambeke : Ghent).
- Arch. f. Anthrop.*—Archiv für Anthropologie; Zeitschrift für Naturgeschichte und Urgeschichte des Menschen (Brunswick).

- Arch. f. math. og Naturv.*—Archiv für Mathematik og Naturvidenskab (Worm-Müller, G. O. Sars, Kristiania).
- Arch. f. Nat.*—Archiv für Naturgeschichte. Neue Folge (Berlin).
- Arch. f. Thierheilk.*—Archiv für Thierheilkunde.
- Arch. ges. Phys.*—Archiv für die gesammte Physiologie des Menschen und der Thiere (Pflüger: Bonn).
- Arch. Ital. Biol.*—Archives Italiennes de Biologie; Revues, Résumés, Reproductions des travaux scientifiques Italiens (Emery & Moeso: Turin).
- Arch. mikr. Anat.*—Archiv für mikroskopische Anatomie (Bonn).
- Arch. Miss. Sci.*—Archives des Missions Scientifiques et Littéraires (Paris).
- Arch. Mus. Lyon*—Archives du Muséum d'Histoire Naturelle de Lyon.
- Arch. Mus. R. Jan.*—Archivos do Museu nacional do Rio de Janeiro.
- Arch. Mus. Teyl.*—Archives du Musée Teyler (Haarlem).
- Arch. Nat. Liv.*—Archiv für die Naturkunde Liv-, Esth-, und Kurlands (Dorpat).
- Arch. natura. Landesforsch. Böhmen*—Archiv für naturwissenschaftliche Landesdurchforschung von Böhmen (Prag).
- Arch. Néerl.*—Archives Néerlandaises des Sciences Exactes et Naturelles (Bosscha: Haarlem).
- Arch. Phys.*—Archives de Physiologie Normale et Pathologique (Brown-Séquard: Paris).
- Arch. Sci. Nat.*—Archives des Sciences Physiques et Naturelles (Geneva).
- Arch. slov. Biol.*—Archives slaves de Biologie (Mendelsohn-Richet: Paris).
- Arch. Ver. Mecklenb.*—Archiv des Vereins der Freunde der Naturgeschichte in Mecklenburg.
- Arch. Zeeuwsch Genoots. Wetensch.*—Archief vroegere en latere Mededeelingen voornamelijk in Betrekking tot Zeeland uitgegeven door het Zeeuwsch Genootschap der Wetenschappen (Middelburg).
- Arch. Z. expér.*—Archives de Zoologie expérimentale et générale (Paris).
- Atti Acc. Gioen.*—Atti dell' Accademia Gioenia di Scienze Naturali (Catania).
- Atti Acc. Napoli*—Atti della R. Accademia delle Scienze Fisiche e Matematiche.
- Atti Acc. Palermo*—Atti della R. Accademia di Scienze, Lettere é Belle Arti di Palermo (Palermo).
- Atti Acc. Pontaniana*—Atti dell' Accademia Pontaniana (Naples).
- Atti Acc. Pontif. Lincei*—Atti dell' Accademia Pontificia de' nuovi Lincei.
- Atti Acc. Tor.*—Atti della R. Accademia delle Scienze di Torino (Turin).
- Atti Ist. Nap.*—Atti del R. Istituto d'incoraggiamento alle Scienze Naturali Economiche e Tecnologiche, &c., di Napoli (Naples).
- Atti Ist. Venet.*—Atti del R. Istituto Veneto di Scienze, Lettere et Arti, &c. (Venice).
- Atti (Mem. Rend.) Acc. Rom.*—Atti (Memorie: Rendiconti) della R. Accademia dei Lincei (Rome).
- Atti (Mem.) Soc. Tosc.*—Atti (Memorie) della Società Toscana di Scienze Naturali residente in Pisa.

- Atti Mus. civico Trieste*—Atti del Museo civico di Storia Naturale di Trieste.
- Atti (Rend. Mem.) Soc. Mod. Mem.*—Atti (Memorie : Rendiconti) della Società dei Naturalisti di Modena.
- Atti Soc. Ital.*—Atti della Società Italiana di Scienze Naturali (Milan).
- Atti Soc. Ven.-Trent.*—Atti della Società Veneto-Trentina di Scienze Naturali residente in Padova (Padua). (Also *Bull.*)
- Atti Univ. Genova*—Atti della R. Università di Genova.
- Auk*—The Auk. A Quarterly Journal of Ornithology. (Continuation of the *Bulletin of the Nuttall Ornithological Club.*)
- Ausland*—Das Ausland (Stuttgart).
- Beitr. Morphol. Mo. phog.*—Beiträge zur Morphologie und Morphogenie (Gerlach : Stuttgart).
- Beitr. Pal. Oesterr.-Ung.* — Beiträge zur Paläontologie Oesterreich-Ungarn's und des Orients (Mojsisovics & Neumayr : Vienna).
- Beitr. Russ. Reiches* (2)—Beiträge zur Kenntniss des Russischen Reiches und der angrenzenden Länder Asiens. Neue Folge (Schrenck & Maximowics : St. Petersburg).
- Ber. Ges. Freiburg*—Berichte der naturforschenden Gesellschaft zu Freiburg (Freiburg, i Br.).
- Bergens Mus. Aarsber.*—Bergens Museum Aarsboretning (Bergen).
- Ber. Ges. Chemn.*—Bericht der naturwissenschaftlichen Gesellschaft zu Chemnitz.
- Ber. Ges. Halle*—Bericht über die Sitzungen der naturforschenden Gesellschaft zu Halle. (Also *Abhandl.*)
- Ber. Ges. Hanau* = *JB. wetter. Ges.*
- Ber. Komm. wiss. Unters. deutsch. Meere*—Bericht der Kommission zur Untersuchung der deutschen Meere.
- Ber. Naturf. Ärzte*—Ämtliche Bericht deutscher Naturforscher und Ärzte.
- Ber. naturf. Ges. Bamberg*—Bericht der naturforschenden Gesellschaft in Bamberg.
- Ber. naturhist. Mus. Hamburg*—Bericht des naturhistorischen Museums in Hamburg.
- Ber. natur. Ver. Passau*—Bericht des naturhistorischen Vereins in Passau.
- Ber. naturw. Ver. Regensburg*—Bericht der naturwissenschaftlichen Vereins in Regensburg. (Formerly *CB.*)
- Ber. Oberhess. Ges.*—Bericht der Oberhessischen Gesellschaft für Natur- und Heilkunde (Giessen).
- Ber. Offenb. Ver.*—Bericht über die Thätigkeit des Offenbacher Vereins für Naturkunde (Offenbach-on-the-Main).
- Ber. Primärsch. Böhm.-Leipa*—Bericht der Primärschule in Böhmisches Leipa.
- Ber. Sächs. Ges.*—Bericht ueber die Verhandlungen der königlichen Sächs. Gesellschaft der Wissenschaft in Leipzig. (Also *Abhandl.*)
- Ber. Senck. Ges.*—Bericht der Senckenbergische naturforschende Gesellschaft im Frankfurt am Main. (Also *Abhandl.*)

- Ber. St. Gall. Ges.*—Bericht über die Thätigkeit der St. Gallischen naturwissenschaftlichen Gesellschaft (St. Gallen).
- Ber. Ver. Augsburg*—Bericht des naturhistorischen Vereins, Augsburg.
- Ber. Ver. Cassel*—Berichte des Vereins für Naturkunde zu Cassel.
- Ber. Ver. Fulda*—Bericht des Vereins für Naturkunde in Fulda.
- Ber. Ver. Pass.*—Bericht der naturwissenschaftlichen Vereins in Passau.
- Berl. Monats.*—Berliner Monatshefte.
- B. E. Z.*—Berliner Entomologische Zeitschrift.
- Bibl. haut. études.*—Bibliothèque de l'école des hautes études. Section des Sciences Naturelles (Paris).
- Bibl. univ.*—Bibliothèque universelle et Revue Suisse (Geneva). (See *Arch. Sci. Nat.*)
- Bibl. Zool.*—Bibliotheca Zoologica (Leipsic).
- Bidr. Finl. Nat.*—Bidrag till Kännedom af Finlands Natur och Folk (Helsingfors).
- Bih. Sc. Ak. Handl.*—Bihang till K. Svenska Vetenskaps-Akademien Handlingar (Stockholm).
- Bijdr. Dierk.*—Bijdragen tot de Dierkunde (Amsterdam).
- Bijdr. Taal-, &c., Ned. Indië* (4)—Bijdragen tot de Taal-, Land-, en Volkenkunde van Nederlandsch Indië. 4^{de} Volgreeks (The Hague).
- Biol. Centralbl.*—Biologisches Centralblatt (Rosenthal : Erlangen).
- Biol. Fören.*—Biologiska Föreningens Förhandlingar. Verhandlungen des biologischen Vereins in Stockholm. (Figerstedt : Stockholm.)
- Bol. Ac. Arg.*—Boletín de la Academia nacional de Ciencias de la Republica Argentina (Cordoba).
- Bol. Mus. la Plata*—Boletín del Museo la Plata (Buenos Ayres).
- Boll. Com. Geol.*—Bollettino del R. Comitato Geologico d'Italia (Roma).
- Boll. Mus. Zool. Anat. Comp. Torino*—Bollettino dei Musei di Zoologia ed Anatomia comparata della R. Università di Torino.
- Boll. Nat.*—Now *Riv. Ital. Sci. Nat.*
- Boll. scient.*—Bollettino scientifico (Maggi, Zoja, & Giovanni : Pavia).
- Boll. Soc. Adr.*—Bollettino della Società Adriatica di Scienze Naturali (Trieste).
- Bol. Soc. Geogr. Lisboa*—Boletim da Sociedade de Geographia de Lisboa (Lisbon).
- Boll. Soc. Ital. Micr.*—Bollettino della Società Italiana dei Microscopisti (Acireale).
- Boll. Soc. geol. Ital.*—Bollettino della Società geologica Italiana (Rome).
- Boll. Soc. Nat. Napoli*—Bollettino della Società di Naturalisti in Napoli. (Formerly *Rivista italiana di scienze naturali* [Circolo degli aspiranti naturalisti].)
- Bot. Centralbl.*—Botanisches Centralblatt. Referenz-Organ für das Gesamtgebiet der Botanik des In- und Auslandes (Uhlwein & Behrens : Cassel).
- Bot. Z.*—Botanische Zeitung (Halle).
- Brit. Med. J.*—British Medical Journal (London).

- Bull. Ac. Belg.*—Bulletin de l'Académie royale des Sciences, des Lettres, et des Beaux Arts de Belgique (Brussels). (Also *Mem.*)
- Bull. Ac. Hippone*—Bulletin de l'Académie d'Hippone (Bône).
- Bull. Am. Mus. Nat. Hist.*—Bulletin of the American Museum of Natural History (New York).
- °*Bull. Brooklyn Soc.*—Bulletin of the Brooklyn Entomological Society (New York).
- Bull. Brookville Soc.*—Bulletin of the Brookville Society of Natural History (Brookville, Indiana, U.S.A.).
- Bull. Buff. Nat. Club*—Bulletin of the Buffalo Naturalists' Club (Buffalo, N.Y.).
- Bull. Bussey Inst.*—Bulletin of the Bussey Institution (Boston).
- Bull. Chicago Ac. Sci.*—Bulletin of the Chicago Academy of Sciences.
- Bull. Denison Univ.*—Bulletin of the Scientific Laboratories of Denison University (Granville, Ohio).
- Bull. Dep. Agric. Ent.*—U.S. Department of Agriculture. Division of Entomology. Bulletin (Washington).
- Bull. Des Moines Ac.*—Bulletin of the Des Moines Academy of Sciences (Des Moines, Iowa).
- Bull. Ent. Ital.*—Bullettino della Società Entomologia Italiana (Florence).
- Bull. Ess. Inst.*—Bulletin of the Essex Institute (Salem, U.S.A.).
- Bull. hebdom. Ass. sci. Fr.*—Bulletin hebdomadaire de l'Association scientifique de France.
- Bull. Illin. Lab. N. H.*—Bulletin of the Illinois State Laboratory of Natural History. (Normal, Illinois.)
- Bull. Inst. Nat. Genevois*—Bulletin de l'Institut nationale Genevois.
- Bull. Lab. Iowa*—Bulletin from the Laboratories of Natural History of the State University of Iowa (Iowa city).
- Bull. Minnesota Acad.*—Bulletin of the Minnesota Academy of Natural Sciences.
- Bull. Mosc.*—Bulletin de la Société impériale des Naturalistes de Moscou.
- Bull. Mus. Belg.*—Bulletin du Musée royal d'Histoire Naturelle de Belgique (Brussels).
- Bull. Mus. C. Z.*—Bulletin of the Museum of Comparative Zoology of Harvard College (Cambridge, U.S.A.).
- Bull. Nat. Hist. Soc. New Brunswick*—Bulletin of the Natural History Society of New Brunswick (St. John's, N.B.).
- Bull. New York Mus. Nat. Hist.*—Bulletin of the New York State Museum of Natural History (Albany).
- Bull. Ohio Exp. Station*—Bulletin of the Ohio Agricultural Experiment Station, Technical Series (Columbus).
- Bull. Pétersb.*—Bulletin de l'Académie impériale des Sciences de St. Pétersbourg.
- Bull. Phil. Soc. Wash.*—Bulletin of the Philosophical Society of Washington.
- Bull. Sci. Fr. Belg.*—Bulletin Scientifique de la France et de la Belgique (Giard: Paris).
- Bull. Sedalia Soc.*—Bulletin of the Sedalia Natural History Society (Sedalia, Mo.).

- Bull. Soc. Ac. Brest*—Bulletin de la Société Académique de Brest.
- Bull. Soc. Acclim.*—Bulletin mensuel de la Société nationale d'Acclimatation de Paris (Paris).
- Bull. Soc. Angers*—Bulletin de la Société d'Études scientifiques d'Angers (Angers).
- Bull. Soc. Anthropol. Lyon*—Bulletin de la Société d'Anthropologie de Lyon.
- Bull. Soc. Anthropol. Par.*—Bulletin de la Société d'Anthropologie de Paris.
- Bull. Soc. Autun*—Société d'Histoire Naturelle d'Autun.
- Bull. Soc. Belg. Micr.*—Bulletin de la Société Belge de Microscopie (Brussels).
- Bull. Soc. Béziers*—Bulletin de la Société d'Étude des Sciences Naturelles de Béziers. Comptes rendus des Séances (Béziers).
- Bull. Soc. Borda-Dax*—Bulletin de la Société de Borda (Dax).
- Bull. Soc. Colm.*—Bulletin de la Société d'Histoire Naturelle de Colmar.
- Bull. Soc. Dinan.*—Bulletin de la Société des Naturalistes Dinantais (Dinant).
- Bull. Soc. Ent. Fr.*—Bulletin des séances de la Société Entomologique de France (Paris) (See *Ann.*).
- Bull. Soc. Étud. sci. Paris*—Bulletin de la Société d'Études scientifiques de Paris.
- Bull. Soc. Finistère*—Bulletin de la Société d'Études scientifiques du Finistère (Morlaix).
- Bull. Soc. Geogr.*—Bulletin de la Société de Géographie (Paris).
- Bull. Soc. Géol.*—Bulletin de la Société Géologique de France (Paris).
- Bull. Soc. L. Bruxelles*—Bulletin de la Société royale Linnéenne de Bruxelles.
- Bull. Soc. L. Nord France*—Bulletin de la Société Linnéenne du Nord de la France (Amiens).
- Bull. Soc. L. Norm.*—Bulletin de la Société Linnéenne de Normandie (Caen).
- Bull. Soc. Mal. Fr.*—Bulletin de la Société Malacologique de France (Paris).
- Bull. Soc. Mal. Ital.*—Bullettino della Società Malacologica Italiana (Pisa).
- Bull. Soc. Metz*—Bulletin de la Société d'Histoire Naturelle de Metz (formerly du Département de la Moselle).
- Bull. Soc. Murith.*—Bulletin des travaux de la Société Murithienne du Valais (Neuchâtel).
- Bull. Soc. Nancy*—Bulletin de la Société des Sciences de Nancy (Paris).
- Bull. Soc. Neuchâtel*—Bulletin de la Société des Sciences Naturelles de Neuchâtel.
- Bull. Soc. Philom.*—Bulletin de la Société Philomathique de Paris.
- Bull. Soc. Rouen*—Bulletin de la Société des Amis des Sciences Naturelles de Rouen (Rouen).
- Bull. Soc. Sarthe*—Bulletin de la Société d'Agriculture, des Sciences, &c., de la Sarthe (Le Mans).
- Bull. Soc. Saône*—Bulletins de la Société des Sciences Naturelles de Saône-et-Loire (Chalons sur Saône.) (Also *Mem.*)

- Bull. Soc. Savoie*—Bulletin de la Société d'Histoire Naturelle de Savoie (Chambéry).
- Bull. Soc. Sci. Phys. Nat. Toulouse*—Bulletin de la Société des Sciences Physiques et Naturelles de Toulouse (Toulouse).
- Bull. Soc. Stat. Isère*—Bulletin de la Société de Statistique des Sciences Naturelles, &c., du Département de l'Isère (Grenoble).
- Bull. Soc. Sud-Est*—Bulletin de la Société des Sciences Naturelles du Sud-Est (Grenoble).
- Bull. Soc. Toulouse*—Bulletin de la Société d'Histoire Naturelle de Toulouse.
- Bull. Soc. Vaud.*—Bulletin de la Société Vandoise des Sciences Naturelles (Lausanne).
- Bull. Soc. Ven. - Trent.*—Bullettino della Società Veneto-Trentina di Scienze Naturali (Padua). (Also *Atti*.)
- Bull. Soc. Yonne*—Bulletin de la Société des Sciences Historiques et Naturelles de l'Yonne (Auxerre).
- Bull. Soc. Z. Fr.*—Bulletin de la Société Zoologique de France (Paris).
- Bull. U. S. Fish Comm.*—Bulletin of the United States Fish Commission (Washington).
- Bull. U. S. Geol. Surv.*—Bulletin of the United States Geological Survey (Washington).
- Bull. U. S. Nat. Mus.*—Bulletin of the United States National Museum (Washington).
- Bull. Washb. Coll.*—Bulletin of the Washburn College Laboratory of Natural History (Topeka, Kansas).

Canad. Ent.—Canadian Entomologist (Saunders : Montreal).

Canad. Nat.—The Canadian Naturalist and Quarterly Journal of Science (Montreal).

Can. Rec.—Canadian Record of Science.

Cardiff Nat. Soc.—Cardiff Naturalists' Society. Report and Transactions (Cardiff).

CZ. Bakt. Parasit.—Centralblatt für Bakteriologie und Parasitenkunde.

CB. Ges. Anthropol.—Correspondenzblatt der deutschen Gesellschaft für Anthropologie, &c. (Brunswick).

CB. Iris—Correspondenz-Blatt des entomologischen Vereins Iris zu Dresden.

CB. med. Wiss.—Centralblatt für die medicinischen Wissenschaften (Berlin).

CB. Ver. Regensh.—(Now *Ber.*).

CB. Ver. Rheinl.—Correspondenz-Blatt des naturhistorischen Vereins der preussischen Rheinlande und Westphalens (Bonn). (Also *Verh. & SB.*)

CB. Ver. Riga—Correspondenzblatt des Naturforscher-Vereins zu Riga.

Cellule—La Cellule. Recueil de Cytologie et d'Histologie Générale (Carnoy, Gilson, & Denys : Liège & Gand).

Chrysanthemum—The Chrysanthemum: a Monthly Magazine for Japan and the Far East (Yokohama).

- Circ. deutsch. Fisch. Ver.*—Circolare des deutschen Fischerei-Vereins (Berlin).
- Cist. Ent.*—Cistula Entomologica (Janson : London).
- °*Comm. Acc. Petersb.*—Commentarii Academiæ Scientiarum imperialis Petropolitane (St. Petersburg).
- Comm. Ateneo Brescia*—Commentari dell' Ateneo di Brescia.
- Conch. Mittheil.*—Conchologische Mittheilungen (Martens : Cassel).
- °*Congr. Sc.*—Congrès Scientifique de France.
- Contr. E. M. Mus. Geol. Princeton*—Contributions from the E. M. Museum of Geology, Princeton College, U.S.A. (Scott & Osborn).
- C.R.*—Comptes rendus des Séances hebdomadaires de l'Académie des Sciences (Paris).
- C.R. Ass. Fr. Sci.*—Compte-rendu de l'Association Française pour l'avancement des Sciences.
- C.R. Ent. Belg.*—Comptes rendus des Séances de la Société Entomologique de Belgique (Brussels).
- C.R. Soc. Biol.*—Comptes rendus hebdomadaires des Séances et Mémoires de la Société de Biologie (Paris).
- C.R. Soc. L. Bord.*—Comptes Rendus de la Société Linnéenne de Bordeaux. (Also *Actes*.)
- Cron. cient.*—Cronica científica. Revista internacional de Ciencias (Rois y Torres : Barcelona).
- Dan. Selok. Skr.*—K. Dansko Videnskabernes Selskabs Skrifter (Copenhagen).
- Denk. Ak. Wien*—Denkschriften der k. Akademie der Wissenschaften zu Wien (Vienna). (Also *SB.*)
- Deutsche e. Z.*—Deutsche entomologische Zeitschrift (Kratz : Berlin).
- E. Mus. Lund.*—E museo Lundii En Samling Af Afhandlinger (Lütken · Kjobnhavn).
- Ent.*—The Entomologist (London).
- Ent. Am.*—Entomologica Americana (Brooklyn).
- Ent. Gen.*—L'Entomologiste Genevois (Geneva).
- Ent. M. M.*—The Entomologist's Monthly Magazine (London).
- Ent. Med.*—Entomologisk Meddelelser udgivne af Entomologisk Forening ved Fr. Meinert Copenhagen.
- Ent. Nachr.*—Entomologische Nachrichten (Karsch : Berlin).
- Ent. Tidskr.*—Entomologisk Tidskrift, på föranstaltande af Entomologiska Föreningen i Stockholm (Spångberg : Stockholm).
- Ertes. math. természett.*—Ertesítő a matematikai és természettudományi közlönyök közlönye (Budapesth).
- Ért. Term. Kör.*—Ertkezesek a természettudományok köréből, Magyar tudományos Akadémia [Memoirs on Natural Science, Hungarian Academy of Sciences] (Budapesth).
- Ess. Nat.*—See *Tr. Ess. Club*.
- Études d'Ent.*—Études d'Entomologie, Faunes Entomologiques, Descriptions d'Insectes nouveaux ou peu connus (C. Oberthür : Reunes).

Erkön. Erd. Muz.—Evkönyvek erdölzi muzeumegylet (Kolozsvar = Klausenberg).

Feuill. Nat.—Feuille des Jeunes Naturalistes (Dollfus : Paris).

Field—The Field (London).

For. & Str.—Forest and Stream.

Forh. Selsk. Chr.—Forhandlinger i Videnskabs-Selskabet i Christiania.

Förh. Sk. Naturf.—Förhandlingar vid de Skandinaviska Naturforskarnes.

Gard. Chron.—The Gardener's Chronicle (London).

Garner—The Garner and Science Recorders' Journal (Ramsay : Walworth).

Gef. Welt—Die gefiederte Welt : Zeitschrift für Vogelliebhaber, -zuchter und -händler (Russ : Berlin).

Geogr. JB.—Geographisches Jahrbuch (Gotha).

Geogr. MT.—Mitteilungen aus Justus Perthes' geographischer Anstalt (Gotha).

Geol. Mag.—Geological Magazine (Woodward : London).

Giorn. Sci. Palerm.—Giornale di Scienze Naturali ed Economiche di Palermo.

Göteborgs Handl.—Göteborgs kongl. Vetenskaps och Vitterhets samhälles Handlingar.

Helios—See *Mon. MT. Ver. Naturw. Frankfurt-a-O.*

Hist. Berwick Nat. Club—History of the Berwickshire Naturalists' Club (Alnwick).

Hor. Ent. Ross.—Hortæ Societatis Entomologicæ Rossicæ (St. Petersburg).

Humboldt—Humboldt : Monatschrift für die gesammten Naturwissenschaften (Stuttgart).

Ibis—The Ibis (Sclater : London).

°Ind. Ann.—The Indian Annals and Magazine of Natural Sciences (An Illustrated Monthly) (Murray : Bombay & London).

Ind. Mus. Notes—Indian Museum Notes (Calcutta).

Insect Life—Insect Life (Washington).

Izvest. Mosc. Univ.—Izvestiya imperatorskova obshchestva lyubitelci Estestvoznaniya, Antropologi i Etnografii Sostoyashova, pre Moskovskom Universitet.

J. Ac. Philad.—Journal of the Academy of Natural Sciences of Philadelphia.

J. Agric. Soc. India—Journal of the Agricultural and Horticultural Society of India (Calcutta).

J. Anat. Phys.—Journal of Anatomy and Physiology (London).

J. A. S. B.—Journal of the Asiatic Society of Bengal (Calcutta).

J. A. S. (Bombay)—Journal of the Bombay Branch of the Royal Asiatic Society.

J. A. S. (Ceylon)—Journal of the Ceylon Branch of the Royal Asiatic Society.

- J. A. S. (China)*—Journal of the China Branch of the Royal Asiatic Society.
J. A. S. (Straits)—Journal of the Straits Branch of the Royal Asiatic Society (Singapore).
JB. Ak. Amst.—Jaarboek van de k. Akademie van Wetenschappen (Amsterdam). (Also *Verhandl.*)
JB. Mijnwezen—Jaarboek van het Mijnwezen in Nederlandsch Oost-Indië (Amsterdam).
JB. geol. Reichsanst.—Jahrbuch der k.-k. geologischen Reichsanstalt (Vienna). (Also *Verhandl.*)
JB. Hamb.—Jahrbuch der Hamburgischen wissenschaftlichen Anstalten.
JB. Karpath. Ver.—Jahrbuch des Ungarischen Karpathen-Vereins (Kés-márk).
JB. k. Akad. Erfurt—Jahrbücher der königlichen Akademie gemeinnütziger Wissenschaften zu Erfurt.
JB. k. preuss. geol. Landesanst.—Jahrbuch der königlich preussischen geologischen Landesanstalt und Bergakademie zu Berlin.
JB. mal. Ges.—Jahrbuch der deutschen malakozologischen Gesellschaft (Kobelt : Frankfurt).
JB. Mineral.—Neues Jahrbuch für Mineralogie, Geologie, und Paläontologie (Leonard & Geinitz : Leipzig).
JB. Mijnwezen Nederl. Indie—Jaarboek van het Mijnwezen van Nederl. Oost Indie (Amsterdam).
JB. Mus. Kärnt.—Jahrbuch des naturhistorischen Landesmuseums von Kärnten (Klagenfurt).
JB. nass. Ver.—Jahrbuch des nassauischen Vereins für Naturkunde (Wiesbaden).
JB. nat. Ges. Nürnberg (? continuation of *Abhandl.*).
JB. Sieb. Karpath. Ver.—Jahrbuch des Siebenbürgischen Karpathen-Vereins (Hermannstadt).
JB. Tharand. Ges.—Jahrbuch der Tharanden forstlichen Gesellschaft (Dresden).
J. Ber. Annab. Ver.—Jahresbericht des Annaberg-Buchholzer Vereins für Naturkunde (Annaberg).
J. Ber. Ges. Graub.—Jahresbericht der naturforschenden Gesellschaft Graubündens (Chur).
J. Ber. Ges. Hannov.—Jahresbericht der naturforschenden Gesellschaft in Hannover.
J. Ber. k. Böhm. Ges. Wiss.—Jahresbericht der königlich böhmischen Gesellschaft der Wissenschaften.
J. Ber. Laurent. Arnsberg—Jahresbericht über das königlichen Laurentianum in Arnsberg.
J. Ber. Pollichia—Jahresbericht der Pollichia eines naturwissenschaftlichen Vereins der Rheinpfalz (Dürkheim a. d. Hart).
J. Ber. Schles. Ges.—Jahresbericht der Schlesischen Gesellschaft für vaterländische Cultur (Breslau). (Also *Abhandl.*)
J. Ber. Schleswig. Ges.—Jahresbericht der naturwissenschaftlichen Gesellschaft in Schleswig.
J. Ber. Ver. Braunsch.—Jahresbericht des Vereins für Naturwissenschaft zu Braunschweig (Brunswick).

- J. Ber. Ver. Elsass-Lothr.*—Jahresbericht des naturwissenschaftlichen Vereins von Elsass-Lothringen (Barr).
- J. Ber. Ver. Frankfurt*—Jahresbericht des physikalischen Vereins zu Frankfurt-am-Main.
- J. Ber. Ver. Magdeburg*—Jahresbericht und Abhandlungen des naturwissenschaftlichen Vereins in Magdeburg.
- J. Ber. Ver. Osnabr.*—Jahresbericht des naturwissenschaftlichen Vereins zu Osnabrück.
- J. Ber. Ver. Zwickau*—Jahresbericht des Vereins für Naturkunde zu Zwickau.
- J. B. v. Westf. Ver.*—Jahresbericht der zoologischen Section des Westfälischen provincial-Vereins für Wissenschaft und Kunst (Münster).
- J. Ber. Wetter. Ges.*—Jahresbericht der Wetterauischen Gesellschaft für die gesammte Naturkunde (Hanau).
- J. B. v. Württemb. Ver. Handelsgeogr.*—Jahresbericht des Württembergischen Vereins für Handelsgeographie (Stuttgart).
- J. Bomb. N. H. Soc.*—Journal of the Bombay Natural History Society (Aitken Sterndale : Bombay).
- J. Brit. Dent. Ass.*—Journal of the British Dental Association (London).
- J. Cincinn. Soc.*—Journal of the Cincinnati Society of Natural History.
- J. Coll. Sci. Japan*—Journal of the College of Science, Imperial University, Japan (Tōkyō).
- J. Comp. Med.*—Journal of Comparative Medicine and Surgery (Conklin & Porter : New York).
- J. de Conch.*—Journal de Conchyliologie (Crosse & Fischer : Paris).
- J. de l'Anat. Phys.*—Journal de l'Anatomie et de la Physiologie (Pouchet : Paris).
- J. Elisha Mitchell S. Soc.*—Journal of the Elisha Mitchell Scientific Society (Raleigh, N.C.).
- Jen. Z. Nat.*—Jenaische Zeitschrift für Naturwissenschaft, herausgegeben von der medicinisch-naturwissenschaftlichen Gesellschaft zu Jena.
- J. f. O.*—Journal für Ornithologie (Cabanis : Leipzig).
- JH. Ver. Lüneb.*—Jahreshefte des naturwissenschaftlichen Vereins für das Fürstenthum Lüneburg.
- JH. Ver. Württ.*—Jahreshefte des Vereins für vaterländische Naturkunde in Württemberg (Stuttgart).
- J. L. S.*—Journal of the Linnean Society ; Zoology (London).
- J. Mar. Biol. Ass.*—Journal of the Marine Biological Association (London & Plymouth).
- J. Morph.*—Journal of Morphology (Whitman & Allis : Boston, U.S.A.).
- J. Microgr.*—Journal de Micrographie (Pellétan : Paris).
- J. Micr. & Nat. Sci.*—Journal of Microscopy and Natural Science. (The Journal of the Postal Microscopical Society. A. Allen : London & Bath.)
- J. Northampt. Soc.*—Journal of the Northamptonshire Natural History Society and Field Club.
- J. N. Y. Micr. Soc.*—Journal of the New York Microscopical Society (New York).

- J. of Conch.*—Journal [formerly Quarterly Journal] of Conchology (London).
Johns Hopk. Univ. Circ.—Johns Hopkins University Circulars (Baltimore).
J. Physiol.—The Journal of Physiology (Foster : Cambridge).
J. Quek. Club—Journal of the Quekett Microscopical Club (London).
J. R. Agric. Soc.—Journal of the Royal Agricultural Society (London).
J. R. Asiat. Soc.—Journal of the Royal Asiatic Society (London).
J. R. Inst. Cornwall—Journal of the Royal Institution of Cornwall (Truro).
J. R. Micr. Soc.—Journal of the Royal Microscopical Society (London).
J. R. Geol. Soc. Ireland—Journal of the Royal Geological Society of Ireland (London, Dublin, & Edinburgh).
J. R. Soc. N. S. W.—Journal and Proceedings of the Royal Society of New South Wales (Sydney).
J. Sci. Lisb.—Jornal de Sciencias, &c., da Academia de Lisboa (Lisbon).
J. Soc. Arts—Journal of the Society of Arts (London).
J. Trenton Soc.—Journal of the Trenton Natural History Society (Trenton, N.J.).
J. Tr. Vict. Inst.—Journal of the Transactions of the Victoria Institute, or Philosophical Society of Great Britain (London).
Jaarb. Univ. Leiden—Jaarboek der Rijks-Universiteit te Leiden (Leiden).

^o*Kosmos*—Kosmos: Zeitschrift für einheitliche Weltauschauung auf Grund der Entwicklungslehre.
Kosmos Lemberg—Kosmos: Lemberg.

L'Ab.—L'Abeille (De Marsoul : Paris).
La Nature—La Nature, Revue des Sciences, &c. (Tissandier : Paris).
Le Nat.—Le Naturaliste (Deyrolle : Paris).
Leopoldina—Leopoldina: Ämtlichen Organ für der k. Leopold-Carol. deutsch. Acad.
Lewisham Ass.—Lewisham and Blackheath Scientific Association.
Lioar Man.—Yn Lioar Manninagh. Published quarterly, for The Isle of Man Natural History and Antiquarian Society (Kermode : Ramsey).
Lotos—Lotos, Jahrbuch für Naturwissenschaft im Auftrage des Vereines 'Lotos' (Prague).
Lunds Univ. Årsskrift.—Lunds Universitets Årsskrift. (Also *Act. Lund.*)

Maandbl. Natuurw.—Maandblad voor Naturwetenschappen (Amsterdam).
Madras Journ.—The Madras Journal of Literature and Science.
Mal. Bl.—Malakozologische Blätter (Clessin : Cassel).
Math. Nat. Ber. Ung.—Mathematische und naturwissenschaftliche Berichte aus Ungarn. Mit Unterstützung der Ungarischen Akad. d. Wiss. und der K. Ungar. naturwiss. Ges. herausgegeben von Baron R. Eötvös, &c. (Fröhlich : Buda-Pest).

- Math. naturw. Mitt.*—Mathematisch-naturwissenschaftliche Mittheilungen Tübingen (ed. Böcklen).
- Math. term. Értes.*—Matematikai és természettudományi Értesítő (Gyula : Buda Pesth).
- Math. term. köz.*—Matematikai és természettudományi közlemények (Buda-Pesth).
- Med. World.*—Medical World.
- Med. Soc. Fenn.*—Meddelanden af Societas pro Fauna et Flora Fennica (Helsingfors).
- Mél. biol.*—Mélanges biologiques tirés du Bulletin de l'Académie impériale des Sciences de St. Petersburg.
- Mém. Ac. Amiens*—Mémoires de l'Académie des Sciences, des Lettres, et des Arts d'Amiens (Amiens).
- Mém. Ac. Aix*—Mémoires de l'Académie des Sciences, Agriculture, Arts, et Belles-lettres d'Aix (Aix en Provence).
- Mem. Ac. Barcel.*—Memorias de la real Academia de Ciencias de Barcelona.
- Mém. Ac. Belg.*—Mémoires de l'Académie royale des Sciences, des Lettres et des Beaux Arts de Belgique (Brussels). (Also *Bull.*)
- Mem. Acc. Bologn.*—Memorie della R. Accademia delle Scienze dell'Istituto di Bologna.
- Mém. Ac. Caen*—Mémoires de l'Académie nationale des Sciences, Arts, et Belles Lettres de Caen. (Formerly *Bulletin*.)
- Mém. Ac. Dijon*—Mémoires de l'Académie des Sciences, Arts, et Belles-Lettres de Dijon.
- Mém. Ac. Lyon*—Mémoires de l'Académie des Sciences, Belles-Lettres et Arts de Lyon (Lyon).
- Mem. Ac. Madrid*—Memorias de la real Academia de Ciencias Exactas Fisicas, y Naturales de Madrid (Madrid).
- Mém. Ac. Metz.*—Mémoires de l'Académie de Metz.
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- Mém. Ac. Rouen*—Précis analytique des travaux de l'Académie des Sciences, Belles-Lettres, et Arts de Rouen (Rouen).
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- Mém. Ac. Toulouse*—Mémoires de l'Académie des Sciences, &c., de Toulouse.
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- MT. anthrop. Ges. Wien*—Mittheilungen der anthropologischen Gesellschaft in Wien (Vienna).
- MT. Aargau. nat. Ges.*—Mittheilungen der Aargauischen naturforschenden Gesellschaft.
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- MT. Ges. Bern*—Mittheilungen der naturforschenden Gesellschaft in Bern.
- MT. Ges. Ostasien's*—Mittheilungen der deutschen Gesellschaft für Natur- und Völkerkunde Ostasien's (Yokohama).
- MT. min. geol. Mus. Dresden*—Mittheilungen aus dem k. mineralogisch-geologischen und prähistorischen Museum in Dresden.

- MT. Münch. ent. Ver.*—Mittheilungen der Münchener entomologischen Vereins.
- MT. orn. Ver. Wien*—Mittheilungen des ornithologischen Vereins in Wien (Vienna).
- MT. Osterlande*—Mittheilungen aus dem Osterlande (Altenberg).
- MT. Schw. ent. Ges.*—Mittheilungen der Schweizerischen entomologischen Gesellschaft (Schaffhausen).
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- MT. Ver. Steierm.*—Mittheilungen des naturwissenschaftlichen Vereines für Steiermark (Gratz).
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- P. Am. Ac.*—Proceedings of the American Academy of Arts and Sciences (Boston).

- P. Am. Ass.*—Proceedings of the American Association for the Advancement of Science.
- P. Am. Micr. Soc.*—Proceedings of the American Society for Microscopists.
- P. Am. Phil. Soc.*—Proceedings of the American Philosophical Society (Philadelphia).
- P. A. S. B.*—Proceedings of the Asiatic Society of Bengal (Calcutta).
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- P. Belf. Soc.*—(See *Report*.)
- P. Biol. Soc. Washington*—Proceedings of the Biological Society of Washington.
- P. Birmingh. Phil. Soc.*—Proceedings of the Birmingham Philosophical Society.
- P. Birmingh. Soc.*—(See *Report*.)
- P. Bos. Soc.*—Proceedings of the Boston Society of Natural History (Boston, U.S.A.).
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- P. Cambr. Phil. Soc.*—Proceedings of the Philosophical Society, Cambridge.
- P. Canad. Inst.*—Proceedings of the Canadian Institute (Toronto).
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- P. Newport Nat. Hist. Soc.*—Proceedings of the Newport Natural History Society.

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- P. R. Geogr. Soc.*—Proceedings of the Royal Geographical Society (London).
- P. R. Inst.*—Proceedings of the Royal Institution of Great Britain (London).
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- Palæontogr.*—Palæontographica: Beiträge zur Naturgeschichte der Vorwelt (Cassel).
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Protok. obsch. estest. Kavan—Protokolui zasyedaniï obshchestva estestvoispytatelei pri imperatorskom Kazanskom Universitetye.

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Rend. Acc. Nap.—Rendiconto dell' Accademia delle Scienze Fisiche e Matematiche (Sezione della Società reale di Napoli).

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- Rep. U. S. Ent. Comm.*—Report of the United States Entomological Commission (Washington).
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- Rev. Tierheilkunde*—Revue für Tierheilkunde und Tierzucht (Vienna).
- Rev. Tr. Sci.*—Revue des Travaux Scientifiques (Paris).
- Rev. Zool.*—Revue Zoologique.
- Riv. Ital. Sci. Nat.*—Rivista italiana di Scienze Naturali e Bollettino del Naturalistâ Collettore, Allevatore, Coltivatore (Brogi : Siena).
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- Samml. Geol. Mus. Leid.*—Sammlungen des Geologischen Reichsmuseums in Leiden.
- SB. Ak. Berlin*—Sitzungsberichte der königlich preussischen Akademie der Wissenschaften zu Berlin (formerly Bericht and Monatsbericht). (Also *Abhandl.*)
- SB. Ak. Wien*—Sitzungsberichte der mathematische-naturwissenschaftlichen Classe der k. Akademie der Wissenschaften (Vienna). (Also *Denkschriften.*)
- SB. Bayer. Ak.*—Sitzungsberichte der mathematisch-physikalischen Classe der k. Bayerischen Akademie der Wissenschaften (Munich). (Also *Abhandl.*)
- SB. Böhm. Ges.*—Sitzungsberichte der k. Böhmisches Gesellschaft der Wissenschaften (Prague). (Also *Abhandl.*)
- SB. Ges. Dorp.*—Sitzungsberichte der Naturforscher Gesellschaft bei der Universität Dorpat (Dragendorff : Dorpat).
- SB. Ges. Isis*—Sitzungsberichte und Abhandlungen der naturwissenschaftlichen Gesellschaft 'Isis' (Dresden). (Also *Abhandl.*)
- SB. Ges. Königsb.*—Sitzungsberichte der k. physikalisch-ökonomischen Gesellschaft in Preussen (Königsberg). (See *Schr. Ges. Königsb.*)
- SB. Ges. Leipzig*—Sitzungsberichte der naturforschenden Gesellschaft zu Leipzig.
- SB. Ges. Marb.*—Sitzungsberichte der Gesellschaft zur Beförderung der gesammten Naturwissenschaften zu Marburg.
- SB. Ges. Morph.*—Sitzungsberichte der Gesellschaft für Morphologie und Physiologie in München (Munich).
- SB. Ges. Würzb.*—Sitzungsberichte des physikalisch-medicinischen Gesellschaft zu Würzburg. (Also *Verh.*)

- SB. Jen. Ges.*—Sitzungsberichte der Jenaischen Gesellschaft für medicin- und-naturwissenschaftlichen Gesellschaft in Jena (Jena).
- SB. nat. Fr.*—Sitzungsberichte der Gesellschaft naturforschender Freunde zu Berlin.
- SB. niederrhein. Ges.*—Sitzungsberichte der niederrheinischen Gesellschaft für Natur- und Heilkunde (Bonn). (Published with *Verh. & CB. Ver. Rheint.*)
- SB. Soc. Erlangen*—Sitzungsberichte der physikalisch-medicinischen Societät zu Erlangen.
- SB. z.-b. Wien*—Sitzungsberichte der zoologisch-botanischen Gesellschaft in Wien (Vienna). (Also *Verh.*)
- Schr. Ges. Danz.*—Neueste Schriften der naturforschenden Gesellschaft zu Danzig (Danzig).
- Schr. Ges. Königsb.*—Schriften der physikalisch-ökonomischen Gesellschaft zu Königsberg in Preussen.
- Schr. gesamt. Naturw. Marburg*—Schriften der Gesellschaft zur Beförderung der gesammten Naturwissenschaften zu Marburg.
- Schr. Nat. Ver. Schleswig*—Schriften des naturwissenschaftlichen Vereins für Schleswig-Holstein (Kiel).
- Schr. Ver. Harzes*—Schriften des naturwissenschaftlichen Vereins des Harzes in Wernigerode.
- Schr. Univ. Kiel*—Schriften der Universität zu Kiel.
- Science*—Science (Dall : Cambridge, Mass.).
- Sci. Goss.*—Science Gossip (Taylor : London).
- Sci. Mem.*—Scientific Memoirs by Medical Officers of the Army of India (Simpson : Calcutta).
- Science Obs.*—Science Observer (Boston Scientific Society, U.S.A.).
- Sci. P. R. Dubl. Soc.*—Scientific Proceedings of the Royal Dublin Society.
- Sci. Tr. R. Dublin Soc.* (2)—The Scientific Transactions of the Royal Dublin Society. Second Series.
- Scot. Nat.*—The Scottish Naturalist (Trail : Perth).
- Sem. Médic.*—La Semaine Médicale.
- Smiths. Contrib. Knowledge*—Contributions to Knowledge by the Smithsonian Institution (Washington).
- Smiths. Misc. Coll.*—Smithsonian Miscellaneous Collections (Washington).
- Soc. Ent.*—Societas Entomologica.
- Soc. Agricole Pyrén.-orient.*—Société Agricole Scientifique et Littéraire des Pyrénées-orientales (Perpignan).
- Soc. Sci. Vitry*—Société des Sciences et Arts de Vitry la François (Arceis sur Aube).
- Sprawozd. Kom. fizyogr.*—Sprawozdanie Komisji fizyograficznej, &c. (Cracow).
- Stud. Biol. Lab. J. Hopkins Univ.*—Studies at the Biological Laboratory of the Johns Hopkins University (Baltimore).
- °Stud. Micr. Sci.*—Studies in Microscopical Science (Cole : London).
- Stud. Mus. Dundee*—Studies from the Museum of Zoology in University College, Dundee (D'Arcy Thompson : Dundee).
- Sr. Ak. Handl.*—K. Svenska Vetenskaps-Akademiens Handlingar (Stockholm).

- Tag. Deut. Nat. Vers.*—Tageblatt der Versammlung deutscher Naturforscher und Aertzte.
- Taprobanian*—The Taprobanian (Nevill : Bombay).
- Tijdschr. Ent.*—Tijdschrift voor Entomologie (The Hague).
- Tijdschr. Ind. Volkenkund*—Tijdschrift voor Indische Taal-, Land- en Volkenkunde, etc. (Brandes & Abendann, Batavia and the Hague).
- Tijdschr. Nederl. Dierk. Ver.* (2)—Tijdschrift van de Nederlandsche Dierkundige Vereeniging (Leyden).
- Tijdschr. Nederl. Ind.*—Naturkundig Tijdschrift voor Nederlandsch Indië (Batavia).
- Timehri*—Timehri : being the Journal of the Royal Agricultural and Commercial Society of British Guiana (Quelch : Demerara).
- Termes Közlöny*—Természettudományi Közlöny kiadja a k. magyar termeszett. Társulat (Budapest).
- Term. füzetek*—Természettudományi füzetek : kiadja a magyar remzeti Múzeum (Journal of Zoology, &c., edited by Hungarian Museum at Budapest).
- Tr. Albany Inst.*—Transactions of the Albany Institute.
- Tr. Am. Phil. Soc.*—Transactions of the American Philosophical Society (Philadelphia).
- Tr. Am. Ent. Soc.*—Transactions of the American Entomological Society (Philadelphia).
- Tr. A. S. Japan*—Transactions of the Asiatic Society of Japan (Yokohama).
- Tr. Barrow Nat. Field Club*—Transactions of the Barrow Naturalists Field Club.
- Tr. Camb. Phil. Soc.*—Transactions of the Cambridge Philosophical Society.
- Tr. Cardiff Nat. Soc.*—(See *Rep. Tr. Cardiff Nat. Soc.*)
- Tr. Conn. Ac.*—Transactions of the Connecticut Academy of Sciences (New Haven).
- Tr. Cumberl. Westmorl. Ass.*—Transactions of the Cumberland and Westmoreland Association for the Advancement of Literature and Science (Goodchild : Carlisle).
- Tr. Devon Ass.*—(See *Rep. Tr. Devon Ass.*)
- Tr. Dumfries Nat. Hist. Soc.*—The Transactions and Journal of Proceedings of the Dumfries and Galloway Natural History and Antiquarian Society (Dumfries).
- Tr. Edin. Geol. Soc.*—Transactions of the Edinburgh Geological Society.
- Tr. Edinb. Nat. Soc.*—Transactions of the Edinburgh Field Naturalists' and Microscopical Society.
- Tr. Ess. Club* = *Ess. Nat.*—Essex Naturalist : being the Journal, Transactions, and Proceedings of the Essex Field Club (Buckhurst Hill).
- Tr. E. Kent Nat. Hist. Soc.*—Transactions of the East Kent Natural History Society (Canterbury).
- Tr. E. Soc.*—Transactions of the Entomological Society of London.
- * *Tr. Geol. Soc.*—Transactions of the Geological Society of London.

- Tr. Hertf. Soc.*—Transactions of the Hertfordshire Natural History Society and Field Club (Watford).
- Tr. Kansas Ac.*—Transactions of the Kansas Academy of Science (Topeka).
- Tr. Leicester Soc.*—Transactions of the Leicester Literary and Philosophical Society (Leicester).
- Tr. L. S. (2)*—Transactions of the Linnean Society, London. Second series.
- Tr. L. S. New York*—Transactions of the Linnean Society of New York.
- Tr. Leeds Nat. Club*—Transactions of the Leeds Naturalists' Club.
- Tr. Manch. Geol. Soc.*—Transactions of the Manchester Geological Society.
- Tr. Manch. Micr. Soc.*—Transactions of the Manchester Microscopical Society.
- Tr. Maryland Ac. Sci.*—Transactions of the Maryland Academy of Sciences.
- Tr. Middlesex Soc.*—Transactions of the Middlesex Natural History and Science Society.
- Tr. Newbury Club*—Transactions of the Newbury District Field Club.
- Tr. Norw. Soc.*—Transactions of the Norfolk and Norwich Naturalists' Society (Norwich).
- Tr. Notts. Soc.*—Transactions of the Nottingham Naturalists' Society.
- Tr. N. York Ac. Sci.*—Transactions of the New York Academy of Sciences (New York).
- Tr. N. Z. Inst.*—Transactions and Proceedings of the New Zealand Institute (Wellington).
- Tr. Odont. Soc.*—Transactions of the Odontological Society.
- Tr. Ottawa Nat. Club*—Transactions of the Ottawa Field-Naturalists' Club.
- Tr. & P. Perthsh. Soc.*—Transactions and Proceedings of the Perthshire Society of Natural Science (Perth).
- Tr. R. Irish Ac.*—Transactions of the Royal Irish Academy (Dublin).
- Tr. S. African Phil. Soc.*—Transactions of the South African Philosophical Society (Cape Town).
- Tr. R. Soc. Canada*—Proceedings and Transactions of the Royal Society of Canada (Montreal).
- Tr. R. Soc. Edinb.*—Transactions of the Royal Society of Edinburgh.
- Tr. R. Soc. S. Austr.*—Transactions and Proceedings and Report of the Royal Society of South Australia (Adelaide).
- Tr. B. Soc. Vict.*—Transactions and Proceedings and Report of the Royal Society of Victoria.
- Tr. Shropshire Soc.*—Transactions of the Shropshire Archaeological and Natural History Society (Shrewsbury and Oswestry).
- Tr. Stirling Soc.*—Transactions of the Stirling Natural History and Archaeological Society.
- Tr. St. Louis Acad.*—Transactions of the Academy of Science of St. Louis.
- ° *Tr. Tyneside Club*—Transactions of the Tyneside Naturalists' Field Club (Newcastle-upon-Tyne).
- Tr. Wagner Inst.*—Transactions of the Wagner Free Institute of Science of Philadelphia.

- Tr. Wisconsin Acad.*—Transactions of the Wisconsin Academy of Sciences, Arts, and Letters (Madison). (Also *Bulletin*.)
- Tr. Woolhope Nat.*—Transactions of the Woolhope Naturalists' Field Club (Hereford).
- Tr. Yorksh. Union*—Transactions of the Yorkshire Naturalists' Union (London & Leeds).
- Tr. Z. S.*—Transactions of the Zoological Society (London).
- Trav. Ac. Reims*—Travaux de l'Académie nationale de Reims (Reims).
- Trav. Inst. Zool. Lille*—Travaux de l'Institut Zoologique de Lille et de la Station maritime de Wimereux (Lille).
- Trav. Lab. Histol.*—Travaux du Laboratoire d'Histologie du Collège de France, École pratique des Hautes Études (Ranvier : Paris).
- Trav. Soc. Univ. Kharkow*—Travaux de la Société des Naturalistes à l'Université impériale de Kharkow.
- Trencsén term. egy.*—Trencsén megyei természettudományi egysület (Trencsén).
- Tromsø Mus. Aarsh.*—Tromsø Museum's Aarsbæfter.
- Trudui Kazan. Univ.*—Trudui obshchestva estestvoispuitatelei pri imperatorskom Kazanskom Universitetzi.
- Trudui Kharkoff Univ.*—Trudui obshchestva ispytatelei prihody pre imp. Kharkovakom universitet (Kharkoff).
- Trudui Russ. Est.*—Trudui sezda ruskich estestvoespytatelei.
- Trudui St. Petersburg Est.*—Trudui sanct Petersburgskagho obshchestva estestvoispuitatelei.
- Uebers. Arb. Schles. Ges. Breslau*—Uebersicht der Arbeiten und Verhandlungen des Schlesischen naturwissenschaftlichen Gesellschaft in Breslau.
- Unters. Nat.*—Untersuchungen zur Naturlehre des Menschen und der Thiere (Moleschott : Giessen).
- Upsala Univ. Årsskrift*—Upsala Universitets Årsskrift (Upsala). (Also *Act. Upsala*.)
- Vannin Lioar.*—(See *Lioar Man*.)
- Verh. Ak. Amat.*—Verhandelingen der koninklijke Akademie van Wetenschappen (Amsterdam). (Also *JB*.)
- Verh. anthrop. Ges.*—Verhandlungen der Berliner anthropologischen Gesellschaft (Berlin).
- Verh. Batav. Genoots.*—Verhandelingen van het Bataviaasch Genootschap van Kunsten en wetenschappen (Batavia) (1880).
- Verh. geol. Reichsanst.*—Verhandlungen der k.-k. geologischen Reichsanstalt (Vienna). (Also *JB*.)
- Verh. Ges. Basel*—Verhandlungen der naturforschenden Gesellschaft in Basel (Bâle).
- Verh. Ges. Würzb.*—Verhandlungen der physikalisch-medicinischen Gesellschaft zu Würzburg. (Also *SB*.)
- Verh. k. Leopold. Carol. Akad. Naturf.*—(See *N. Act. Ac. Leop. Carol. Nat. cur.*)

- Verh. naturw. Ver. Karlsruhe* — Verhandlungen des naturwissenschaftlichen Vereins in Karlsruhe.
- Verh. schweiz. Naturf. Ges.* — (See *Act. Soc. Helv.*)
- Verh. Siebenb. Ver.* — Verhandlungen und Mittheilungen des Siebenburgischen Vereins für Naturwissenschaften (Hermannstadt).
- Verh. Ver. Brünn.* — Verhandlungen des naturforschenden Vereins in Brünn.
- Verh. Ver. Hamb.* — Verhandlungen des Vereins für naturwissenschaftliche Unterhaltung zu Hamburg.
- Verh. Ver. Heidelb.* — Verhandlungen des naturhistorisch-medicinischen Vereins zu Heidelberg.
- Verh. Ver. Presburg* — Verhandlungen des Vereins für Natur- und Heilkunde zu Presburg.
- Verh. Ver. Rheinl.* — Verhandlungen des naturhistorischen Vereins der preussischen Rheinlande und Westphalen (Bonn). (Also *CB.*)
- Verh. z.-b. Wien* — Verhandlungen der kaiserlichen-königlichen zoologisch-botanischen Gesellschaft in Wien (Vienna). (Also *SB.*)
- Versl. Ak. Amst.* — Verslagen en Mededeelingen der k. Akademie van Wetenschappen (Amsterdam).
- Vict. Nat.* — Victorian Naturalist (Melbourne).
- Vid. Medd.* — Videnskabelige Meddelelser fra den naturhistoriske Forening (Copenhagen).
- Viert. Ges. Zürich* — Vierteljahrsschrift des naturforschenden Gesellschaft in Zurich (Wolf : Zurich).
- Wesley Nat.* — The Wesley Naturalist. Monthly Journal of the Wesley Scientific Society (Dallinger et alii : London).
- West Am. Scientist* — The West American Scientist (San Diego).
- Wiedomości z nauk przyrod.* = Materialien zu dem Wissenschaften (Warsaw)
- Wien. ent. Z.* — Wiener entomologische Zeitung (Vienna).
- Wilt. Mag.* — The Wiltshire Archaeological and Natural History Magazine (Devizes).
- York. Phil. Soc.* — Yorkshire Philosophical Society Annual Report (York).
- Young Nat.* — The Young Naturalist (Morley : Huddersfield).
- Z. Biol.* — Zeitschrift für Biologie (München).
- Z. Ent. Bresl.* — Zeitschrift für Entomologie (Breslau).
- Z. Ferdinunt. Tirol Vorarlberg* — Zeitschrift des Ferdinandeums für Tirol und Vorarlberg (Innsbrück).
- Z. f. Ethnol.* — Zeitschrift für Ethnologie (Bastian & Hartmann : Berlin).
- Z. f. Tiermed.* — Zeitschrift für Tiermedizin und vergleichende Pathologie).
- Z. geol. Ges.* — Zeitschrift der deutschen geologischen Gesellschaft (Berlin).
- Z. ges. Orn.* — Zeitschrift für die gesammte Ornithologie (Von Madarász : Budapest).
- Z. Naturw.* — Zeitschrift für Naturwissenschaften. Original Abhandlungen und Berichte herausgegeben im Auftrage der naturwissenschaftlichen Vereins für Sachsen und Thüringen (Braas : Halle-a-S.).

- Z. wiss. Geogr.*—Zeitschrift für wissenschaftliche Geographie (Kettler : Lahr, in Baden).
Z. wiss. Mikr.—Zeitschrift für wissenschaftliche Mikroskopie und für mikroskopische Technik (Berens : Braunschweig).
Z. wiss. Zool.—Zeitschrift für wissenschaftliche Zoologie (Kölliker & Ehlers : Leipzig).
Zapiski Kiev.—Zapiski Kievskagho Obshchestva Estestvoispytatelei (Kieff).
Zapiski Novoross. Obsch. Estestv.—Zapiski Novorossiskagho Obshchestva Estestvoispytatelei (Odessa).
Zoe—Zoe : A Biological Journal (San Francisco).
Zool.—The Zoologist (Harting : London).
Zool. Anz.—Zoologischer Anzeiger (Carus : Leipzig).
Zool. Beitr.—Zoologische Beiträge (Schneider : Breslau).
Zool. Gart.—Der Zoologische Garten (Noll : Frankfurt).
Zool. Jahrb.—Zoologische Jahrbücher (Spengel : Giessen).
Zool. JB.—Zoologischer Jahresbericht (Mayer & Giesbrocht : Berlin).
Zool. Mag.—The Zoological Magazine (Tokyo).
Zool. Rec.—The Zoological Record (Beddard : London).
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An asterisk prefixed to a quotation signifies that the Recorder has not seen the journal or work referred to.

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ZOOLOGICAL RECORD

FOR 1889.

GENERAL SUBJECTS.*

BY

J. ARTHUR THOMSON, M.A., F.R.S.E.

PLAN OF RECORD.

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(A.) GENERAL WORKS, TEXT-BOOKS, ESSAYS, &c.

(1.) COMPREHENSIVE SERIES, &c.—The special monographic works or series will be found in their proper places throughout the various records. Some of the contributions to the larger series are here noted.

British Museum Catalogues. (See appropriate records.) R. LYDEKKER : Fossil *Reptilia* and *Amphibia*, Parts II & III. A. S. WOODWARD : Fossil Fishes, Part I. G. A. BOULENGER : Chelonians, Rhynchocephalians, and Crocodiles.

BRONN'S *Klassen und Ordnungen des Thierreichs*. Under appropriate records see the works of : M. BRAUN, *Vermes* ; O. BÜTSCHLI, *Protozoa* ; C. CHUN, *Celenterata* ; Hs. GADOW, *Aves* ; A. GERSTÄCKER, *Crustacea* ; C. K. HOFFMANN, *Reptilia* ; W. LECHE, *Mammalia* ; H. LUDWIG, *Echinodermata*.

* An asterisk prefixed to a quotation indicates that the Recorder has not seen the work referred to.

CARUS, J. V. Register zum "Zoologischer Anzeiger." Jahrg. I-X, Nos. 1-268. Leipzig : 1889, 8vo, iv & 444 pp.

Challenger Reports. SLADEN, W. P., *Asteroidea*, see *Echinodermata*. WRIGHT, E. P., and STUDER, TH., *Alcyonaria*, see *Celenterata*. GÜNTHER, A., Pelagic Fishes, see *Pisces*. WATERS, A. W., *Polyzoa* (q.v.). BROOK, G., *Antipatharia*, see *Celenterata*. STUDER, TH., *Alcyonaria*, see *Celenterata*. HECKEL, E., *Keratosa*, see *Porifera*.

Encyclopädie der Naturwissenschaften herausgegeben von FÖRSTER, KENNGOTT, &c. Handwörterbuch der Zoologie, Anthropologie, und Ethnologie. Bd. VI. Breslau : 8vo, pp. 129-256.

MCCOY, F. Prodrum of the Zoology of Victoria. XVIII, pp. 289-295, pls. clxxi-clxxx ; XIX, pp. 297-323, pls. clxxxi-cxc. See *Crustacea*, *Polyzoa*, *Reptilia*, &c.

TASCHENBERG, O. Bibliotheca Zoologica. Verzeichniss der Schriften über Zoologie 1861-1880. 2nd Bd. Leipzig : 8vo, signatur 109-210.

ZITTEL, K. A. v. Palæontographica. Beiträge zur Natrgeschichte der Vorzeit. Bd. XXXV. Stuttgart : 1888-89, fol., 268 pp., 29 pls. See *Pisces* and *Mollusca*.

(2.) TEXT-BOOKS.—The large number of asterisks in this section is explained by the absence of many of the foreign text-books in the libraries. Among the works seen, those of LANG, NEUMAYR, NICHOLSON & LYDEKKER, STEINMANN & DÖDERLEIN, VOGT & YUNG may be especially noted.

BEAUREGARD, H. (See POUCHET, G.)

°BEHRENS, W., KOSSEL, A., & SCHIEFFERDECKER, P. Das Microscop und die Methoden der mikroskopischen Untersuchung. I Bd. : Die Gewebe des menschlichen Körpers und ihre mikroskopischen Untersuchung. Braunschweig : 8vo, viii & 315 pp.

°BERG, C. Tratado elemental de Zoologia. 2 Tomos. I. Zoologia general ; II. Zoologia especial. Buenos Aires : 8vo, 16 & 321, xii & 260 pp., 315 figs. (1887-89).

°BOGDANOFF, A. Medicinische Zoologie. II. Embryologische Briefe. (Russian.) Moskau : 8vo, 423 pp.

°BOS, H. Het Leven der Dieren. Een Leesboek der Dierkunde. Zwolle : 8vo, 24 & 529 pp., 18 pls.

°CHAUVEAU, A., & ARLOING, S. Traité d'Anatomie comparée des Animaux domestiques. 4 Ed. revue et augmentée. Paris : 8vo, 1064 pp., 455 figs.

GENERAL WORKS, TEXT-BOOKS, ESSAYS, ETC. *Gen. Sub. 3*

- °DEBIERRE, CH. Manuel d'embryologie humaine et comparée. Précédé d'une préface de M. J. Renaut. Tours & Paris: 18mo, x & 794 pp., 321 figs., & 8 col. pls.
- DÖDERLEIN, L. [See STEINMANN, G.]
- ECKER, A. The Anatomy of the Frog. Translated, with numerous Annotations and Additions, by George Haslam. London: 8vo, xvi & 449 pp., 261 figs., and 2 col. pls.
- °ECKSTEIN, K. Repetitorium der Zoologie. Leipzig: 8vo, x & 303 pp., 240 figs.
- °FRIEDLÄNDER, C. Mikroskopische Technik zum Gebrauch bei medicinischen und pathologisch-anatomischen Untersuchungen. 4 verm. u. verbess. Aufl. bearb. von. C. J. Eberth. Berlin: 8vo, viii & 210 pp., 47 figs., 1 pl.
- GIBSON, R. J. HARVEY. A Text-Book of Elementary Biology. London: 8vo, 362 pp., 192 figs.
- °GIROD, P. Manipulations de Zoologie; Guide pour les travaux pratiques de dissection. Animaux invertébrés. Paris: 8vo, viii & 9-140 pp., 25 pls.
- HASLAM, G. [See ECKER, A.]
- HATSCHKE, B. Lehrbuch der Zoologie. Eine Morphologische Uebersicht des Thierreiches zur Einführung in das Studium dieser Wissenschaft. Lief. 2. Jena: 8vo, pp. 145-304, 141 figs.
- HAYEK, G. Handbuch der Zoologie. Bd. IV, Abt. 1. *Vertebrata allantoïlica*. Wien: 8vo, 240 pp., 428 figs.
- °KATTER, F. Lehrbuch der Zoologie. Theil II. Breslau: 8vo, pp. 185-424, illustr.
- °KULTSCHITZKY, N. Grundzüge der praktischen Histologie (Russiau). I Teil. Charkow: 8vo, 117 pp., 24 figs.
- LANG, A. Lehrbuch der vergleichenden Anatomie zum Gebrauch bei vergleichend-anatomischen und zoologischen Vorlesungen. 9 gänzlich umgearbeitete Auflage von E. O. Schmidt's Handbuch der vergleichenden Anatomie. 2 Abth. Jena: 8vo, pp. 291-566, figs. 192-384.
- LYDEKKER, R. [See NICHOLSON, H. A.]
- MILLS, W. A Text-Book of Animal Physiology. New York: 8vo, ix & 700 pp., 505 figs.
- NEUMAYR, M. Die Stämme des Thierreichs. Wirbellose Thiere. Bd. I. Wien & Prag: 8vo, vi & 603 pp., 192 figs.
- NICHOLSON, H. A., & LYDEKKER, R. A Manual of Palaeontology for the use of students, with a general introduction on the principles of palaeontology. Third Edition, rewritten and greatly enlarged. London & Edinburgh: 8vo, vol. I, xviii & 885 pp., 812 figs.; vol. II, xi & 889-1624 pp., 813-1419 figs.

4 Gen. Sub.

GENERAL SUBJECTS.

- °PICATOSTE, F. *Elementos de Historia Natural*. Madrid : 4to, 301 pp.
- POUCHET, G., & BEAUREGARD, H. *Traité d'ostéologie comparée*. Paris : 8vo, xviii & 468 pp., 331 figs.
- °RAMÓN Y CAJAL. *Manual de histología normal y de técnica micrográfica*. Valencia : 4to, 692 pp., 203 figs.
- °RAWITZ, B. *Leitfäden für histologische Untersuchungen*. Jena : 8vo, viii & 75 pp.
- STEINMANN, G., & DÖDERLEIN, L. *Elemente der Paläontologie*. 2 Hälfte. Leipzig : 8vo, xix & 337-848 pp., figs. 387-1030.
- VOGT, C., & YUNG, E. *Lehrbuch der praktischen vergleichenden Anatomie*. Bd. II. Lief. 1, pp. 1-64, figs. 1-36 ; Lief. 2, pp. 65-128, figs. 37-60. Braunschweig : 8vo. [Also French Edition : *Traité d'anatomie comparée pratique*. Paris : 8vo.]
- ZITTEL, K. A. VON. *Handbuch der Paläontologie*. Paläozoologie. 12 Lief. München & Leipzig : 8vo, pp. 437-632.

(3.) ILLUSTRATIONS, DIAGRAMS, &C.

- °ENGLEDER, F. *Wandtafeln für den naturkundlichen Unterricht (Thierkunde)*. Lief. 1, 2, & 3. Esslingen : each with 6 pls.
- °HARTINGER, A. *Wandtafeln für den naturgeschichtlichen Anschauungs-Unterricht*. Abth. Zoologie, von F. Steindachner, A. v. Pelzeln, A. Rogenhofer, H. Kraus, und F. Brauer. Vollständig in 13 Lief. Wien : fol., 65 col. pls.
- °HAYEK, G. v. *Grosser Volksatlas der Naturgeschichte aller drei Reiche*. 3 Aufl. Lief. 17-37, each 4 pls. Wien : fol.
- LEUCKART, R., & NITSCH, H. *Zoologische Wandtafeln*. Lief. 30-36. Taf. 69-84. Cassel : diagram form, with 4 pp. 4to text to each diagram.
- SMITH, W. R., & NORWELL, J. S. *Illustrations of Zoology*. Vertebrates and Invertebrates. Edinburgh : 4to, 70 pls.
- VAYSSIÈRE, A. DE. *Atlas d'Anatomie comparée des Invertébrés*. Paris : 4to, 4 fascicules.

(4). MORPHOLOGICAL.—The following list includes some works and papers dealing with general morphological problems, such as the origin of the *Vertebrata*, of the mesoderm, &c.

- °BEARD, J. *Morphological Studies*. Jena : 8vo, pp. 23, 77, & 57, 13 pls.
- BEAUNIS, H. *L'Évolution du Système Nerveux*. Paris : 12mo, 316 pp., 237 figs.
- BLANCHARD, R. *De la Nomenclature des Êtres Organisés*. BUL. Soc. Z. Fr. xiv, pp. 212-282.

- DUVAL, M. Le troisième Œil des Vertébrés. *J. Microgr.* xii, pp. 308, 336-340, 368-376, 401-405, 429-433, 459-465, 500-507, & 523-527; xiii, pp. 16-20, 42-48, & 76-83.
- FILHOL, H. Des liens qui rattachent la Zoologie à la Paléontologie. *Bull. Soc. Z. Fr.* xiv, pp. 196-211.
- GADOW, H. On the Modifications of the First and Second Visceral Arches, with especial reference to the homologies of the Auditory Ossicles. *Phil. Tr.* clxxix B (1888), pp. 451-485, 4 pls.
- GASKELL, W. H. On the relation between the Structure, Function, Distribution, and Origin of the Cranial Nerves; together with a Theory of the Origin of the Nervous System of *Vertebrata*. *J. Physiol.* x, pp. 153-211, 5 pls.
- GEGENBAUR, C. Ontogenie und Anatomie in ihren Wechselbeziehungen betrachtet. *Morph. JB.* xv, pp. 1-9.
- HÄTSCHEK, B. Die paarigen Extremitäten der Wirbeltiere. *Verh. Anat. Ges.* iii, pp. 82-90, 4 figs.
- . Die Rippen der Wirbeltiere. *T. c.* pp. 113-120, 6 figs.
- HIS, W. Die Neuroblasten und deren Entstehung im embryonalen Mark. *Abh. sächs. Ges.* xv, pp. 313-372, 4 pls.
- LACAZE-DUTHIERS, H. DE. La méthode en Zoologie. *Rev. Sci.* xliv, pp. 162-171.
- LANKESTER, E. RAY. Contributions to the knowledge of *Rhabdopleura* and *Amphioxus*. London: 4to, 70 pp., 10 pls. [Reprinted from *Q. J. Micr. Sci.*]
- MAREY, E. J. Des lois de Morphogénie chez les Animaux. *Arch. Phys.* xxi, pp. 88-101.
- PERÉNYI, J. Die Entwicklung der Keimblätter und der Chorda in neuer Beleuchtung. *Anat. Anz.* iv, pp. 587-592, 10 figs.
- PERRIER, E. Sur les services que l'Embryogénie peut rendre à la Classification. *Bull. Soc. Z. Fr.* xiv, pp. 173-198.
- RABL, C. Ueber die Principien der Histologie. *Verh. Anat. Ges.* iii, pp. 39-62.
- A remarkable attempt to generalise histological facts.
- . Theorie des Mesoderms. *Morph. JB.* xv, pp. 113-253, 4 pls., 9 figs.
- SARASIN, P. & F. Ergebnisse naturwissenschaftlicher Forschungen auf Ceylon in den Jahren, 1884-1886. Bd. II. Zur Entwicklungsgeschichte und Anatomie der Ceylonischen Blindwühle, *Ichthyophis glutinosus*. Teil 3. Das Schicksal des Dotters; Über die Homologie der Keimblätter im Tierreiche auf Grund des Satzes, das die beiden Keimschichten der Gastrula nicht dem Ectoderm und Entoderm, sondern dem Blastoderm und Dotter der Vertebraten entsprechen, &c. Wiesbaden: 4to, pp. 95-150, 3 pls.
- SUTTON, J. B. On the Evolution of the Central Nervous System of *Vertebrata*. *Brain*, xi, pp. 336-342, 7 figs.

TOLSTOPIATOW, T. Illusions, scepticisme, aspirations des naturalistes. Fluctuations des idées scientifiques. Idées cosmiques. Bull. Mosc. No. 4, 1888 (1889), pp. 598-617.

Chiefly on the relation of crystallisation to organisation.

VEJDOVSKY, F. Vývoj a morfologie nervosí soustavy bilaterii. SB. bōhm. Ges. ii, pp. 95-160, 2 pls.

(5.) POPULAR AND PRACTICAL.

ALLEN, GRANT. Falling in Love, with other essays on more exact branches of science. London: 8vo, 356 pp.

Characteristic essays on evolution and heredity, ants and giant animals, mimicry and latent life, distribution, &c. This must serve as a type of many other popular works here unrecorded.

ANONYMOUS. Woodland, Moor, and Stream: being the Notes of a Naturalist. London: 8vo, 224 pp.

^cBARANSKI, A. Thierproduction. Theil i. Naturgeschichte und Racenlehre der Hausthiere. Wien: 8vo, 160 pp.

^oBENNETT, R. A. R. Marine Aquaria; their construction, arrangement, and management. London: 8vo, 141 pp., illustr.

CHAMBERS'S Encyclopædia New Edition. Vol. III, 828 pp., 2 maps.

Numerous zoological articles, *e.g.*, Caterpillars, Cattle, Cell, Crab, Darwinian Theory.

— . New Edition. Vol. IV, 828 pp., 6 maps, 1 pl.

Numerous zoological articles, *e.g.*, Dog, Embryology, Evolution, Fisher, Fox.

^oCOOKE, M. C. Toilers of the Sea. London: 8vo, 369 pp., 4 pls., 70 figs.

FAUVELLE, —. De l'Instinct. Bull. Soc. Anthropol. xii, pp. 47-58.

FAYRER, J. The Deadly Wild Beasts of India. Nineteenth Cent. xxvi, pp. 218-240; *cf.* pp. 963-983.

FLOWER, W. H. Presidential Address British Association, 1889. Rep. Brit. Ass. pp. 3-24; Nature, xl, pp. 463-469.

Chiefly occupied with discussion of museums.

FRÉDÉRICQ, L. La Lutte pour l'Existence chez les Animaux Marins. Paris: 16mo, 303 pp., 37 figs.

GRUBER, A. Ueber den Werth der Specialisirung für die Erforschung und Auffassung der Natur. Ber. Freiburg Ges. iv, pp. 135-147, 16 figs.

Some of the general problems of biology vividly illustrated in the life-history of *Euglypha*.

*HINTERWALDNER, J. M. Wegweiser für Naturaliensammler. Eine Anleitung zum Sammeln und Conservieren von Thieren, Pflanzen und Mineralien jeder Art, sowie zur rationeller Anlage und Pflege von Terrarien, Aquarien, &c. Wien : 8vo, viii & 663 pp., 340 figs.

HÆCKEL, E. Natürliche Schöpfungs-Geschichte. 8te umgearbeitete und vermehrte Auflage. Berlin : 8vo, xxviii & 832 pp., portrait, 20 pls., 20 figs.

HOUSSAY, F. Les Industries des Animaux. Paris : 8vo, 312 pp., 47 figs.

An exceedingly vivid account of the industrial habits of animals.

JONES, W. Glimpses of Animal Life. London : 8vo, 229 pp.

A treasury of illustrations of animal intelligence and the like.

KNIGHT, F. A. By Leafy Ways. London : 8vo, 197 pp.

— Idylls of the Field. London : 8vo, 182 pp.

Two popular books of great merit, warranting their place here.

°LESSONA, M. Storia naturale illustrata. Parte I. Mammiferi. Milano : 8vo, 996 pp.

MEYERS' Konversations-Lexikon. Vol. XIII, 1028 pp., 198 figs., 25 pls., &c.; numerous articles, *e.g.*, Physiologie, Protozoa, Raubthiere, Rind. Vol. XIV, 1052 pp., 275 figs., 51 pls., &c.; numerous articles, *e.g.*, Schaf, Schmetterling, Schnecken, Schwimmvögel, Skelet. Vol. XV, pp. 1044, 285 figs., 44 pls., &c.: Sperlingsvögel, Straussvögel, Stubenvögel, Tauben, Tienschncken.

°PIZZETTA, J. Dictionnaire populaire illustré d'Histoire Naturelle. Fasc. I. Paris : 8vo, 120 pp.

REID, MAYNE. The Naturalist in Siluria. London : 8vo, 240 pp., 20 figs.

°RUHLE, F. Bilder aus der Thierwelt. Bd. I. Säugethiere. Münster : 8vo, viii & 406 pp., 60 figs.

RUSS, K. Das heimische Naturleben im Kreislauf des Jahre*. Ein Jahrbuch der Natur unter Mitwirkung von E. v. Homeyer, A. Bau, W. Hasse, P. Lehmann, &c. Berlin : 8vo, xxv & 559 pp.

A year book for botanists, zoologists, gardeners, farmers, &c.

TAYLOR, J. E. The Playtime Naturalist. London : 8vo, xvi & 287 pp., 366 figs.

ZACHARIAS, O. Bilder und Skizzen aus dem Naturleben. Jena : 8vo, 328 pp., 49 figs.

Popular essays, mostly zoological.

(6.) PHYSIOLOGICAL.

°ASSIER, A. D'. Essai de Philosophie naturelle. Paris : 12mo, 318 pp.
Including discussion of organisms.

°BINET, A. Études de Psychologie expérimentale. La vie psychique des micro-Organismes. Paris : 8vo, 307 pp., illustr.

°[BINET, A.] *The Psychic Life of Micro-Organisms : a study in experimental psychology.* Translated by Th. McCORMACK. Chicago : 8vo. Reviewed by G. J. ROMANES, *Nature*, xl, pp. 541 & 542.

°BLUMBERG, J. *Ueber die vitalen Eigenschaften isolierter Organe.* Inaug. Dissert. Dorpat : 8vo, 36 pp.

BUNGE, G. *Lehrbuch der Physiologischen und Pathologischen Chemie.* 2 verm. und verb. Aufl. Leipzig : 8vo, 404 pp.

CALLEJA, C. *Principles of Universal Physiology : a reform in the theories of Physics, Chemistry, Biology, and Cosmology.* London : 8vo, vii & 146 pp.

COLLIER, W. *The Comparative Insensibility of Animals to Pain.* Nineteenth Cent. xxvi, pp. 622-627.

CUÉNOT, L. *Études sur le Sang et les Glandes Lymphatiques dans la Série Animale. Première Partie. Vertébrés.* Arch. Z. expér. vii, pp. 1-89, 4 pls.

DANGEARD, P. A. *La Chlorophylle chez les Animaux.* C.R. cviii, pp. 1313 & 1314.

DUBOIS, R. *Le Sommeil Hibernant est-il le résultat d'une auto-intoxication physiologique.* C.R. Soc. Biol. 1889, pp. 260 & 261.

— *Sur la Ventilation Pulmonaire chez les Hibernants.* T. c. pp. 280-282.

FAMINTZIN, A. *Beitrag zur Symbiose von Algen und Thieren.* Mém. Ac. Petersb. xxxvi, No. 16, 36 pp., 2 pls.

Symbiosis of Tintinnus inquilinus and Chatoceros sp. ; of "yellow cells" in Radiolarians and Actinia (see Protozoa).

FOSTER, M. *A Text-Book of Physiology.* 5th Edition, largely revised. Part II, comprising Book II. *The Tissues of Chemical Action, with their respective Mechanisms. Nutrition.* London : 8vo, pp. xxii & 355-846, figs. 62-95.

GROBBEN, C. *Ueber Arbeitstheilung.* Wien : 8vo, 24 pp.

HODGKINSON, A. *Colour and its Relation to the Structure of coloured bodies ; being an investigation into the Physical Causes of Colour in natural and artificial bodies, and the Nature of the Structure producing it.* P. Soc. Manch. xxxii, pp. 193-212, 1 pl.

IRVINE, R., & WOODHEAD, G. SIMS. *Secretion of Carbonate of Lime by Animals.* P. R. Soc. Edinb. xv, pp. 308-316, xvi, pp. 324-354 : Rep. Brit. Ass. 1889, p. 637.

JOURDAN, E. *Les Sens chez les Animaux inférieurs.* Paris : 16mo, 314 pp., 48 figs.

GADEAU DE KERVILLE, H. *Les Animaux et les Végétaux lumineux.* Paris : 8vo, viii & 327 pp., 49 figs.

KOWALEVSKY, A. *Ein Beitrag zur Kenntniss der Exkretionsorgane.* Biol. Centralbl. ix, pp. 33-47, 65-76, 127, & 128.

- °[KOWALEVSKY, A.] Organes excréteurs des animaux invertébrés. Mém. Soc. nouv. Russ. xiv, pp. 79-84.
- LATASTE, F. Qu'est-ce que l'être vivant? Définition nouvelle. C.R. Soc. Biol. i (ix), pp. 5-8.
- LEUCKART, R. Die Parasiten des Menschen und die von ihnen herrührenden Krankheiten. 2 Aufl., Bd. i, Lief. 4. Leipzig: 8vo, Abth. i, pp. xxxi & 855-1000, Abth. ii, pp. ix & 97-440, 131 figs.
- °LINSTOW, O. v. Compendium der Helminthologie, Nachtrag—Die Litteratur der Jahre 1879-1889. Hannover: 8vo, xvi & 151 pp.
- MACMUNN, C. A. Notes on some Animal Colouring Matters examined at the Plymouth Marine Biological Laboratory. J. Mar. Biol. Ass. i, pp. 55-62.
- . Contributions to Animal Chromatology. Q. J. Micr. Sci. cxviii, pp. 51-97, 1 pl.
- MARCHAL, P. L'Acide Urique et la Fonction Rénale chez les Invertébrés. Mém. Soc. Zool. iii, pp. 31-97.
- °MARENZELLER, E. VON. Ueber Meerleuchten. Wien: 8vo, 27 pp.
- . Neues über leuchtende Seethiere. Verh. z.-b. Wien, xxxix, pp. 3 & 4.
- °——. Ueber Meerleuchten. Schr. nat. Kenntn. xxix (1889) pp. 137-161.
- MILLS, W. A Textbook of Animal Physiology. New York: 8vo, ix & 700 pp., 505 figs.
- °PFLÜGER, E. F. W. Die allgemeinen Lebenserscheinungen. Bonn: 8vo, 34 pp.
- RICHET, CH. La Chaleur Animale. Paris: 8vo, 309 pp., 47 pls.
- ROUX, W. Die Entwicklungsmechanik der Organismen, eine anatomische Wissenschaft der Zukunft. Wien. Med. Presse, xxx, Nos. 49, 50, & 51; also Wien: 8vo, 26 pp.
- RYDER, J. A. A Physiological Theory of the Calcification of the Skeleton. P. Am. Phil. Soc. xxvi, pp. 550-558.
- BURDON-SANDERSON, J. S. Presidential Address, Section D., British Association, 1889. Rep. Brit. Ass. pp. 604-614.
- SMITH, R. MEADE. The Physiology of the Domestic Animals. Philadelphia & London: 8vo, xiii & 938 pp., 416 figs., 6 pls.
- VERWORN, M. Psycho-physiologische Protisten-Studien. Experimentelle Untersuchungen. Jena: 8vo, viii and 219 pp., 6 pls., 27 cuts.
- WOODHEAD, G. SIMS. [See IRVINE, R.]
- WUNDT, W. Philosophische Studien. Bd. v. Heft 3. Leipzig: 8vo, pp. 327-497.
- Inter alia*, Biologische Probleme.

(7.) TRAVELS AND FAUNISTIC.

CARUS, J. V. *Prodromus Faunæ Mediterraneæ*. Vol. II, pt. i. *Brachistomata, Mollusca*. Stuttgart: 8vo, pp. 272.

See *Mollusca*.

FISCHER, P. Détermination des Régions du Globe dont la Faune est insuffisamment connue. *Bull. Soc. Z. Fr.* xiv, pp. 138-172.

HEILPRIN, A. The Bermuda Islands; a Contribution to the Physical History and Zoology of the Somers Archipelago. With additions by J. P. McMURRICH, H. A. PILSBRY, G. MARX, P. R. UHLER, C. H. BOLLMAN. Philadelphia: 8vo, 231 pp., 18 pls.

HICKSON, S. J. A Naturalist in North Celebes: a Narrative of Travels in Minabassa, the Sangir and Talaut Islands, with notices of the Fauna, Flora, and Ethnology of the districts visited. London: 8vo, xv and 392 pp., 2 maps, 35 figs.

LUMHOLTZ, C. Among Cannibals: an Account of Four Years' Travels in Australia, and of Camp Life with the Aborigines of Queensland. London: 8vo, 412 pp., 122 figs., maps, &c.

PRZEWALSKI, N. M. Wissenschaftliche Resultate der von N. M. Przewalski nach Centralasien unternommenen Reisen. *Zool. Theil*. Bd. I. Säugethiere von E. Büchner, Lief. 3, pp. 89-136, 5 pls. (see *Mammalia*). Bd. III. Lief. 2, pp. 91-180, 5 pls., Fische von S. Herzenstein (see *Pisces*). (Russian and German.) St. Petersburg and Leipzig: 4to.

RAMSAY, E. P. Lord Howe Island, its Zoology, Geology, and Physical Characters. Sydney: 8vo, viii and 132 pp., illustr.

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(8.) HISTORICAL.

BOGDANOW, A. Materials for a History of Zoology in Russia during the years 1850-88, expressed in Biographies of Russian Naturalists. (In Russian.) Moskau: 4to, 2 vols., 210 & 312 pp., 24 pls.

BOLTON, S. K. Famous Men of Science. (Biographical Sketches of Linnaeus, Cuvier, Humboldt, Audubon, Agassiz, Buckland, Darwin, and others.) New York: 12mo, with portraits.

LE CLERC, GUILLAUME. Le Bestiaire. Das Thierbuch des normannischen Dichters Guillaume le Clerc, zum ersten Male vollständig nach den Handschriften von London, Paris, und Berlin, mit Einleitung und Glossar herausgegeben von R. Reinsch. Leipzig: 8vo, 441 pp., 10/-.

DUVAL, M. Le Transformiste français Lamarck. Bull. Soc. Anthropol. Lyon, xii (1889), pp. 336-374.

(*Cf.* Rev. Sci. xliv, pp. 417-424 & 459-466.

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Summary of Buffon's conclusions on evolution, reproduction, heredity, &c.

°LAUCHERT, F. Geschichte des Physiologus. Strassburg: 8vo, xiii & 312 pp.

MARTENS, E. v. Ueber den Grad von Wahrscheinlichkeit, der beim Bestimmen der den Alten bekannten Tierarten erreicht werden kann. SB. nat. Fr. 1889, pp. 69-76.

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TACHENBERG, O. Bibliotheca Zoologica. Lief. 7, Sign. 241-280. Leipzig: 8vo, pp. 1971-2290.

°VARIGNY, H. DE. Charles Darwin. Paris: 12mo, vi & 207 pp., 20 figs.

(B.) THEORY OF EVOLUTION.

(1) *General.*

Among the numerous works devoted in 1889 to the discussion of organic evolution, WALLACE'S "Darwinism" and WEISMANN'S papers are regarded by common consent as of great importance. Besides these, attention may be directed to the cited works or papers of COPE, EIMER, GEDDES, GEDDES & THOMSON, GIARD, MIVART, ROMANES, and RYDER, and to the discussions in "Nature."

ARGYLL. Acquired Characters and Congenital Variation. Nature, xli, pp. 173 & 174.

°BAILLET, —. De l'Atavisme et de l'Origine des reproducteurs chez les principaux espèces d'Animaux Domestiques. Mém. Ac. Toulouse, x, pp. 314-341.

BATESON, W. [See Environment.]

VAN BEMMELEN, J. F. Ueber die Entwicklung der Farben und Adern auf den Schmetterlingsflügeln. Tijdschr. Nederl. Dierk. Ver. Leiden, ii, pp. 235-247.

——. De Ontwikkeling der Kleuren en aderen van de Vleugels der Vlinders in de Pop. Handl. Nederl. Natuur. en Geneeskundig Congres Leiden (1889), p. 90.

°BINET, A. [See General Works.]

°BOURCART, E. Erklärung der Variation der Vogeleier. Genf. : 8vo, 20 pp.

BROCK, J. Die Stellung Kant's zur Descendenztheorie. Biol. Centralbl. viii, pp. 641-648.

BROOM, R. On a monstrosity of the Common Earthworm, *Lumbricus terrestris*, L. P. N. H. Soc. Glasg. 1889, pp. 203-206.

Lumbricus terrestris, with bifid hinder ends, compared with the twinning of *L. trapezoides*.

BUTLER, A. G. A few Remarks respecting Insects supposed to be distasteful to Birds. Ann. N. H. iv, pp. 171-173.

——. Notes made during the summer, 1887, on the effect of offering various insects, larvæ, and pupæ to Birds. T. c. pp. 463-473.

Answer to E. B. Poulton (*q. r.*). No insect in any stage (excepting the red-tailed humble-bee, which was only offered to the missel-thrush), was rejected by all Mr. Butler's birds. Those refused by some were eagerly devoured by others, so that none seemed to enjoy perfect immunity from destruction.

CHABRY, L. [See POUCHET, G.]

CHAVEAU, A. Sur le Transformisme en Microbiologie pathogène. C.R. cix, p. 554.

°CHRISTIAN, E. P. Philosophy of Causation of some Congenital Abnormalities of Structure. Am. Lancet, xiii, pp. 41-45.

°CONNERT, D. Die allmähliche Vervollkommnung der Wirbeltiere. Mediasch: 4to, 27 pp.

COPE, E. D. An Outline of the Philosophy of Evolution. P. Am. Phil. Soc. xxvi, pp. 495-505.

——. The Mechanical Causes of the Development of the Hard Parts of the *Mammalia*. J. Morph. iii, pp. 137-290, 93 cuts, 6 pls.

The structure of the Mammalian skeleton and dentition may be referred broadly to excess of growth and defect of growth. The origin and development of structure through motion. The same structure appears in distinct phyla which are subjected to the same mechanical conditions. Different structures appear in different parts of the skeleton of the same individual animal in direct correspondence with the different mechanical conditions to which these parts have been subjected.

[COPE, E. D.] Lamarck *versus* Weismann. Nature, xli, p. 79.

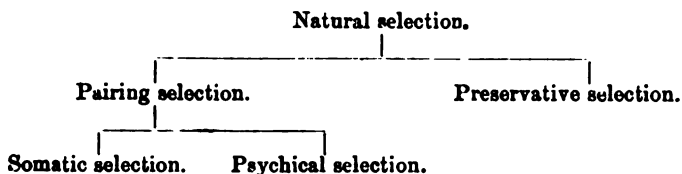
CUNNINGHAM, J. T. Weismann's Theory of Variation. (Letter to) *op. cit.* xxxix, pp. 388 & 389.

On Weismann's theory of variation, evolution is impossible.

— . Lamarck *versus* Weismann. (Letter to) *op. cit.* xl, p. 297.

DAHL, F. Die Bedeutung der geschlechtlichen Zuchtwahl bei der Trennung der Arten. Zool. Anz. xii, pp. 262-266.

The idea of "physiological selection" said to have been stated by the author in 1881.



DALL, W. H. Report on the *Mollusca*. Part II. *Gastropoda* and *Scaphopoda*. Bull. Mus. C. Z. xviii, pp. 1-492, 21 pls.

See *Mollusca*. In deep-sea fauna there is no mimicry or sexual selection, for all is dark; and, as the supply of food from the surface is greater than the demand, the struggle for existence is almost wholly environmental.

°DIEROLDER, J. Darwin's Grundprincip der Abstammungslehre, an der Hand zahlreicher Autoritäten kritisch beleuchtet. St. Gallen: 8vo, 47 pp.

DÖNITZ, W. Die Feinde der Schmetterlinge mit Rücksicht auf den Schutz, welcher letzteren durch Anpassung und Nachahmung gewährt wird. SB. nat. Fr. 1889, pp. 85 & 86.

Examples of facts which have led the author to believe that the import of mimicry has been exaggerated.

DREYER, F. [See Cell.]

Evolution of Rhizopod shells discussed in relation to the Mode of Life, to Shell-material, to the Environmental Conditions.

DREYFUS, L. Ueber Phylloxerinen. Wiesbaden: 8vo, 88 pp.

Inter alia: in certain generations, the ova of one mother give rise to completely different animals, which pass simultaneously through quite different developmental cycles. Similar "parallel series" probably occur in other insects.

EIMER, G. H. T. Die Artbildung und Verwandtschaft bei den Schmetterlingen. Eine systematische Darstellung der Abänderungen, Abarten und Arten der Segelfalterähnlichen Formen der Gattung *Papilio*. Jena: 8vo, xii & 243 pp., 23 figs., with fol. atlas of 4 cold. pls.

See *Insecta*. The author's conclusions as to the origin of species (see 1888) illustrated in the varieties and species of *Papilio*. The variations

of colour and markings are all definite and progressive, sometimes towards greater complexity, but as often towards simplification. "All the details, even the minutest, show that the origin of variations, varieties, and species depends throughout on orderly physiological changes in definite directions. Various characters change, *pari passu*, in correlative or kaleidoscopic modifications. There is nothing in the origin of new characters which can be referred to adaptation or sexual selection in the Darwinian sense."

FAUVELLE, —. De la distinction à faire en Anthropologie entre les Caractères de Race et les Caractères Évolutifs. *Bull. Soc. Anthropol.* Par. xii, pp. 135-144.

FICKERT, C. Ueber die Zeichnungsverhältnisse der Gattung *Ornithoptera*. *Zool. Jahrb.* iv, pp. 692-770, 3 pls.

Varieties and species of *Ornithoptera* occur in series so orderly that the notion of fortuitous variation is excluded, and that of progressive constitutional growth, emphasized by Eimer, confirmed.

FRÉDÉRICQ, L. La Lutte pour l'Existence chez les Animaux Marins. Paris: 16mo, 303 pp., 37 figs.

GALTON, F. [See Heredity.]

The second chapter, on organic stability, deals with variation, and argues that evolution need not proceed by small steps only.

GARMAN, S. On the Evolution of the Rattlesnake. *P. Bost. Soc.* xxiv, pp. 171-182, 2 pls.

GEDDES, P. Article "Evolution." *Chambers's Encyclopædia*, iv, pp. 477-484.

The general scheme of evolution a materialised ethical process, or subordination of self-maintaining to species-maintaining.

GEDDES, P., & THOMSON, J. A. [See Sex.]

Discussion of sexual selection, natural selection, sexual reproduction, reproductive sacrifice, and other factors in evolution.

GIARD, A. L'Évolution des Êtres Organisés. Leçon d'ouverture. *Bull. Sci. Fr. Belg.* iii, pp. 1-26.

—. Les Facteurs de l'Évolution. *Rev. Sci.* xlv, pp. 641-648.

GRASSMANN, F. L. Die Schöpfungslehre des heiligen Augustinus und Darwins. Regensburg: 8vo, viii & 142 pp.

GULICK, J. T. Lessons in the theory of Divergent Evolution drawn from the Distribution of the Landshells of the Sandwich Islands. *P. Bost. Soc.* xxiv, pp. 166 & 167.

HÆCKEL, E. *Natürliche Schöpfungsgeschichte*. 8 umgearb. u. verm. Aufl. Berlin: 8vo, xxviii & 832 pp., 20 pls.

HARGITT, C. W. Interesting cases of Color Variation. *Am. Nat.* xxiii, pp. 449 & 450.

HARTMANN, E. v. Ergänzung zur 1-9 Auflage der Philosophie des Unbewussten. Leipzig : 8vo, 36 & 539 pp.

The Unconscious and Darwinism ; the Physiology of the Nerve-Centres ; &c.

°PÉGER, P. La Structure du Corps Humain et l'Évolution. Bruxelles : 8vo, 32 pp. ; cf. J. Méd. Bruxelles, lxxxviii.

HERDMAN, W. A. On some Recent Contributions to the Theory of Evolution. Inaug. Address. P. Liverp. Biol. Soc. iii, pp. 1-22.

JAMES, J. F. On Variation, with special reference to certain Palæozoic Genera. Am. Nat. xxiii, pp. 1071-1087.

°JOUSSET, P. Evolution et Transformisme. Des Origines de l'état sauvage. Paris : 18mo, xii & 234 pp.

BAYNARD-KLEIN, L. E. Mental Evolution in Man. Dublin Rev. xliii, pp. 157-173.

Criticism of G. J. Romanes' work.

LANG, A. Zur Charakteristik der Forschungswege von Lamarck und Darwin. Jena : 8vo, 28 pp.

LANKESTER, E. RAY. Darwin *versus* Lamarck. (Letter to) Nature, xxxix, pp. 428 & 429.

——. Review of A. R. Wallace's Darwinism. Nature, xl, pp. 567-570.

——. Darwinism. (Letter to) Nature, xli, p. 9.

——. Mr. Cope on the Causes of Variation. (Letter to) Nature, xli, pp. 128 & 129.

°LAURENS, CH. L'Évolution et M. Herbert Spencer. Lyon : 8vo, 35 pp.

LENDL, A. [See Heredity.]

Various suggestions on the problems of evolution.

LÖW, F. [See Reproduction.]

Splitting of one generation of *Chermes abietis* into two sets.

°LOOSS, A. Ueber Degenerationserscheinungen im Thierreich, besonders bei den Wirbelthieren. Tag. Deut. Nat. Vers. 1889, pp. 50-54.

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MIVART, ST. GEORGE. The Origin of Human Reason : being an examination of recent hypotheses concerning it. London : 8vo, 327 pp.

——. On Truth : a systematic Inquiry. London : 8vo, x & 380 pp.

See chaps. xxi-xxvii : Organic Nature ; Functions of Organisms ; Animal Faculties ; External Relations of Organisms ; Nature ; A First Cause ; Evolution.

NAVILLE, E. La question de l'Origine des Espèces. Bibl. Univ. xliii, pp. 449-466 ; xliv, pp. 63-83.

°NEUMANN, C. *Unsere Vogelwelt im Kampfe um das Dasein.* Ilmenau: 8vo, 61 pp.

OSBORN, H. F. *The Palæontological Evidence for the Transmission of Acquired Characters.* Rep. Brit. Ass. 1889, pp. 621-623.

Outline of Neo-Lamarckian opinions.

PACKARD, A. S. [See Environment.]

Notes on evolution, pp. 137-143.

PECKHAM, G. W. & E. G. [See Sex and Reproduction]

PECKHAM, E. G. *Protective Resemblances in Spiders.* Occasional Papers. Nat. Hist. Soc. Wisconsin, i, pp. 61-113, 1 pl., 12 figs.

Valuable illustrations of protective adaptation.

PENARD, E. *Étude sur quelques Héliozoaires d'eau douce.* Arch. Biol. ix, pp. 419-472, 3 pls.

Inter alia, notes on the variation of spicules, &c., in *Acanthocystia*.

PFITZNER, W. [See SCHWALBE, G.]

°POTONIÉ, H. A. Moritzi, ein zu wenig gewürdigter Vorgänger Darwin's. Naturwiss. Wochenschr. iv, pp. 222 & 223.

POULTON, E. B. Mr. A. G. Butler's Remarks upon Distasteful Insects. Ann. N. H. iv, pp. 358-360.

— Weismann's Theory of Variation. (Letter.) Nature, xxxix, p. 412.

The number of ancestral germ-plasmas in each sperm- and germ-nucleus is so large that abundant scope for variation is continuously afforded.

QUATREFAGES, A. DE. *Histoire Générale des Races Humaines.* Paris: 8vo, xxxiii & 618 pp., 236 figs., 2 pls., 5 maps.

See especially Chapters II and III on general questions.

— Les Théories Transformistes. Rev. Sci. xlv, pp. 65-72.

"En somme, les transformistes sont des alchimistes."

Report of Committee appointed for the purpose of investigating the effects of different Occupations and Employments on the physical development of the Human Body. Rep. Brit. Ass. lviii (1889), pp. 100 & 101.

RILEY, C. V. On the Causes of Variation in Organic Forms. P. Am. Ass. xxvii (1888), pp. 225-273.

Chiefly historical.

RICHIE, D. G. *Darwinism and Politics.* London: 8vo, 101 pp.

Deals chiefly with the social aspects of natural selection, rate of reproduction, and heredity.

°ROHAUT, C. A. *Du Transformisme et de la Génération Spontanée.* Étude Scientifique et Philosophique. Paris: 8vo, xx & 148 pp.

ROMANES, G. J. *Mental Evolution in Man. Origin of Human Faculty.* London : 8vo (1888), viii & 452 pp.

— On the Mental Faculties of the Bald Chimpanzee (*Anthropopithecus calvus*). P. Z. S. 1889 (iii), pp. 316-321.

— Darwinism. Letters to Nature, xl, p. 645, & xli, pp. 59 & 60.

— Mr. Wallace on Darwinism. Contemp. Rev. lvi, pp. 244-258.

RYDER, J. A. *Proofs of the Effects of Habitual Use in the Modification of Animal Organisms.* P. Am. Phil. Soc. xxvi, pp. 541-549.

Argument to show that "natural selection" has had absolutely nothing to do with the genesis of the primordial type from which all vertebral axes are evolved. The transverse fractures of the "soft rays" of fishes are the direct results of use. Disuse of the fins would result in absolutely depriving them of one of their most salient characters. Whether the effects thus mechanically produced anew in the course of the life of every generation are inherited, is a matter of no consequence, since there is no need in this case for an appeal to the influence of heredity.

°SERGI, G. *Le Degenerazioni umane.* Milano : 8vo, 228 pp.

°SETTEGAST, H. *Der Darwinismus in seinem Verhältnis zur Naturforschung, Religion, und Freimaurerei.* Berlin : 8vo, 31 pp.

°SCHNEIDER, A. *Der Speciesbegriff in der Biologie.* Mühlbach : 4to, 32 pp.

SCHWALBE, G. *Das Darwin'sche Spitzohr beim menschlichen Embryo.* Anat. Anz. iv, pp. 176-189.

— Inwiefern ist die menschliche Ohrmuschel ein rudimentäres Organ. Arch. Anat. Phys. Suppl. Bd. 1889, pp. 241-270, 1 pl.

— & PFITZNER, W. *Varietäten-Statistik und Anthropologie.* Anat. Anz. iv, pp. 705-714.

SHARP, B. *Change of Habit causing Change of Structure.* P. Ac. Philad. 1889, pp. 347 & 348.

SKERTCHLY, S. B. J. *On Butterflies' Enemies.* Ann. N. H. iii, pp. 477-485.

— On the Habits of certain Bornean Butterflies. *Op. cit.* iv, pp. 209-218.

Mimicry protects butterflies on the wing from birds; protective resemblance saves them during sleeping and resting hours from lizards, small mammals, &c.

°TARUFFI, C. *Storia della Teratologia.* Parte I, vol. v. Bologna : 8vo, 593 pp.

TITCHENER, E. B. *Protective Coloration of Eggs.* Nature, xli, pp. 129 & 130.

1889. [VOL. XXVI.]

°TUTT, J. W. Investigation of Variation. Ent. xxii, pp. 272 & 273.

VERWORN, M. [See General Works.]

°WAGNER, M. Die Entstehung der Arten durch räumliche Sonderung. Gesammelte Aufsätze, herausgegeben von M. Wagner, mit Biographie von K. v. Scherzer. Basel : 8vo, 676 pp.

WALLACE, A. R. Darwinism : an Exposition of the Theory of Natural Selection, with some of its applications. London : 8vo, viii & 494 pp., 37 figs, 1 map, and portrait.

The "whole work tends forcibly to illustrate the overwhelming importance of natural selection over all other agencies in the production of new species." *Inter alia*, a proof that all specific characters are (or once have been) either useful in themselves, or correlated with useful characters ; a proof that natural selection can, in certain cases, increase the sterility of crosses ; a fuller discussion of the colour relations of animals, with additional facts and arguments on the origin of sexual differences of colour ; discussion of cross-fertilisation and dispersal of seeds ; conclusions affirmative of the non-inheritance of acquired characters ; and a new argument as to the nature and origin of the moral and intellectual faculties of man.

WALLACE, A. R., & GRENSTED, F. F. Protective Coloration of Eggs. Nature, xli, p. 53.

WARD, LESTER F. Fortuitous Variation, as illustrated by the Genus *Eupatorium*. Report of above (Biol. Soc. Wash. 1888) in Nature xl, p. 310.

The forms which have succeeded in surviving are those, and only those, that were possible under existing conditions ; that is, they have been developed along the lines of least resistance, pressure along all other lines having resulted in failure.

BRUNNER v. WATTENWYL, C. Ueber einen Fall von Rücksichtslosigkeit der Natur. Verh. z.-b. Wien. xxxix, pp. 47-49.

The occurrence of unnecessary and disadvantageous variations ; example found in the colouring of the head of *Maskucide* (*Orthoptera*).

WEISMANN, A. [See Heredity.]

°VAN WIJHE, J. W. Het Lichaam van den Mensch als Getuigenis van zijne Afkomst. Redevoering. Groningen : 8vo, 40 pp.

2. *Environment.*

Special attention may be directed to the researches of BATESON, GARMAN, IRVINE & WOODHEAD, PACKARD, POUCHET & CHABRY, and VERWORN.

°ANON. Ueber Farbenänderung bei Thieren, hervorgerufen durch besondere Futterstoffe. Nat. Wochenschr. iv, p. 263.

ADDUCO, V. Action de la Lumière sur la Durée de la Vie, la Perte de Poids, la Température et la Quantité de Glycogène Hépatique et Musculaire chez les Pigeons soumis au Jeûne. Arch. Ital. Biol. pp. 208-214.

— Azione della Luce sopra la Durata della Vita, la Perdita in Peso, la Temperatura, e la Quantità di Glicogeno Epatico e Muscolare nei Colombi sottoposti al Diggiuna. Atti (Rend.) Acc. Rom. v, pp. 684-689.

°BADERTSCHER, G. A. Ueber den Einfluss der Temperatur auf Phosphorescenz-Erscheinungen. Bern : 8vo, 38 pp.

BATAILLON, E. Recherches expérimentales sur la Métamorphoses des Anoures. C.R. cix, pp. 682-684.

BATESON, W. On some Variations of *Cardium edule*, apparently correlated to the Conditions of Life. P. R. Soc. xlv, pp. 204-211.

A comparison of stages in the origin of natural variations. Shells from separate lakes or particular levels have special characters ; those from similar conditions resemble one another.

BECKER, A. Die Einwirkung der Witterung auf Pflanzen und Thiere. Bull. Mosc. No. 3, 1889, pp. 623-628.

BETTGER, O. Ein Kapitel über die Einwirkung von Klima und Boden auf die Thierwelt. Zool. Gart. xxx, pp. 1-8 & 33-42.

BUNGE, G. Weitere Untersuchungen über die Athmung der Würmer. Z. Physiol. Chem. xiv, pp. 318-324.

Species of *Ascaris* will live and move for four to six days in media quite free from oxygen ; their intimate respiratory processes must therefore be peculiar.

BÜTSCHLI, O. Protozoa in Bronn's Klassen und Ordnungen, pp. 1713-1840.

See *Protozoa* ; but here relevant is the author's discussion of the influences of temperature, electricity, chemicals, &c.

CERTES, A. Protozoaires de Cap Horn. Mission Scientifique de Cap Horn, vi, pp. 1-53, 6 pla.

Inter alia, some examples of successful revivification of *Infusoria*, &c., after prolonged dessication.

CHABRY, L. [See POUCHET, G.]

CLARK, J. [See Cell.]

The influence of reduced oxygen supply on the activities of protoplasm.

DALL, W. H. [See Evolution.]

In concluding pages some general considerations on deep-sea Molluscs in relation to their environment.

EXNER, S. Die durch Licht bedingte Verschiebungen des Pigmentes im Insectenauge und deren physiologische Bedeutung. SB. Ak. Wien. xcvi, p. 143.

FAMINTZIN, A. Beitrag zur Symbiose von Algen und Thieren. Mém. Ac. Pétersb. xxxvi, No. 16, 36 pp., 2 pls.

GARMAN, S. Cave Animals from South-western Missouri. Bull. Mus. C. Z. xvii, 6, pp. 225-240, 2 pls.

Description of blind fish and Crustacean. Problem of origin.

GIACOMINI, C. Tératogénie expérimentale chez les Mammifères. Arch. Ital. Biol. xii, pp. 305-325.

The influence of disturbing mechanical factors in development.

GIARD, A. Sur la Castration Parasitaire des *Typhlocyba* par une Larve d'Hyménoptère (*Aphelopus melaleucus*, Dalm.) et par une Larve de Diptère (*Atelenevra spuria*, Meig). C.R. cix, pp. 708-710.

GRABER, V. Ueber die Empfindlichkeit einiger Meertiere gegen Riechstoffe. Biol. Centralbl. viii, pp. 743-754.

GRANDIS, V. [See Spermatogenesis.]

GRUBER, A. Biologische Studien an Protozoen. Biol. Centralbl. ix, pp. 14-23.

Vacuolation of marine *Protozoa* in fresh water. The environmental variations were transitory, however; disappearing when the original conditions were restored.

HAYCRAFT, J. BERRY, & CARLIER, E. W. [See Cell.]

IRVINE, R., & WOODHEAD, G. SIMS. On the Secretion of Carbonate of Lime by Animals. Part I. P. R. Soc. Edinb. xv, pp. 308-316; Rep. Lab. Coll. Phys. Edinb. i, pp. 62-69. Part II. P. R. Soc. Edinb. xvi, pp. 324-354.

Hens supplied with sulphate of lime, but no other lime-salt, produce well-formed egg-shells composed of carbonate of lime. In sea-water there is very little soluble carbonate of lime, the sulphate is probably the chief source of supply for the carbonate of lime in the skeletons of marine animals. Crabs which have cast their shells in artificial sea-water (without carbonate of lime, but with chloride and sulphate) can form a new shell of carbonate. In the case of corals, it may be that the carbonate of ammonia produced by the decomposition of the effete products of animals (urea, &c.) decomposes a portion of the sulphate of lime in the sea-water, with the formation of carbonate of lime.

LINDNER, G. Studien über die Biologie und hygienische Bedeutung der im Essig lebenden Nematoden. CB. Bakt. Parasit vi, pp. 633-638, 663-668, & 694-698.

The females reproduce oviparously or viviparously according to the nutritive medium and temperature. Difference in size followed differences of culture.

LUCIANI, L., & PIUTTI, A. [See Oogenesis.]

The influence of lowered temperature, drought, restricted space, &c., on ova of silk moth.

MARCACCI, A. Influence du Mouvement sur le Développement des Œufs de Poule. Arch. Ital. Biol. xi, pp. 164-184.

MASSART, J. Sensibilité et Adaptation des Organismes à la Concentration des Solutions Salines. Arch. Biol. ix, pp. 515-570.

MÉGNIN, P. [See Reproduction.]

The encystation of *Glyciphagus* in disadvantageous conditions.

MERRIFIELD, F. Incidental Observations in Pedigree Moth-Breeding (*Selene illustrata*). Tr. E. Soc. 1889, pp. 79-97.

The larvæ of spring brood of moths take much longer to feed up than those of the summer brood. Cold during earlier stages tends to produce darker hues in the adult, hence perhaps the melanism of northern varieties.

MINGAZZINI, P. Ricerche sul Canale Digerente dei Lamellicorni Fitofagi. MT. z. Stat. Neap. ix, pp. 266-304, 3 pls.

Influence of diet on the size of the mid-gut.

MORPURGO, B. Sulla Produzione di Nuovi Elementi nei Tessuti di Animali nutriti dopo un lungo Diggiuno. Atti (Rend.) Acc. Rom. v, pp. 744 & 745.

PACKARD, A. S. The Cave Fauna of North America, with remarks on the Anatomy of the Brain and Origin of the Blind Species. Mem. Nat. Ac. Sci. iv (read in 1886, dated 1888), 156 pp., 27 pls.

Description of caves; vegetable and animal life therein; geographical distribution and list of cave forms; anatomy of brain and rudimentary eyes; origin and evolution of cave fauna; bibliography.

POUCHET, G., & CHABRY, L. L'Eau de Mer artificielle comme Agent Tératogénique. J. de l'Anat. Phys. xxv, pp. 298-307, 4 figs.

POUCHET, G., & CHABRY, L. De la Production des Larves Monstreuses d'Oursin, par Privation de Chaux. C.R. cviii, pp. 196-198. [Cf. C.R. Soc. Biol. ix, No. 2.]

Monstrous larvæ of *Echini* produced by removal of some of the carbonate of lime from the sea-water. Morphological deviation increases as more of the lime is removed.

VERWORN, M. [See General Works.]

Relation of the *Protozoa* to electrical stimulation.

WHEELER, W. M. [See Oogenesis, *Insecta*.]

The force of gravitation has perceptible influence on the development of the eggs of *Blattus*; these are unable to move in their envelopes, and have their orientation predetermined.

WOODHEAD, G. SIMS. [See IRVINE, B.]

*ZACHARIAS, O. Ueber den Ursprung der Süßwasser-Thierwelt. MT. Nat. Verein. Frankfurt-a.-O. vi, p. 231.

3. *Heredity.*

The two most important works here recorded are GALTON's *Natural Inheritance* and WEISMANN's collected essays. With the latter most of the year's literature is directly concerned.

BONNET, R. Die Stummelschwänzigen Hunde im Hinblick auf die Vererbung erworbener Eigenschaften. (Reported by J. DINGFELDER.) *Biol. Centralbl.* ix, pp. 217-223.

°BOVERI, TH. Die Vorgänge der Befruchtung und Zellteilung in ihrer Beziehung zur Vererbungsfrage. *Verh. Münchener anthropol. Ges.* viii, pp. 27-40, 2 pls.

COPE, E. D. *Lamarck versus Weismann*. (Letter to) *Nature*, xli, p. 79.

If whatever is acquired by one generation were not transmitted to the next, no progress in the evolution of a character could possibly occur. [*Cf.* The Post-Darwinians. *Am. Nat.* xxiii, pp. 136 & 137.]

— On Inheritance in Evolution. *Am. Nat.* xxiii, pp. 1058-1071.

CUNNINGHAM, J. T. *Lamarck versus Weismann*. (Letter to) *Nature*, xl, p. 297.

The eye-twisting in flat-fishes.

°DANFORTH, G. A Law of Heredity, or, possibly, Maternal Impressions. *Texas Rec. of Medicine*, vi, pp. 79-81.

°DUVAL, M. L'Hérédité expliquée par l'Embryologie. *Le Progrès médical*, ix, p. 52.

GALTON, F. *Natural Inheritance*. London: 8vo, 259 pp.

The higher methods of statistics, which consist in applications of the law of frequency of error, were found eminently suitable for expressing the processes of heredity. An equation is based on the fact that the characteristics of any population that is in harmony with its environment may remain statistically identical during successive generations. The law of regression may be described as follows:— Each peculiarity in a man is shared by his kinsmen, but *on the average* in a less degree. It is reduced to a definite fraction of its amount, quite independently of what its amount might be. The fraction differs in different orders of kinship, becoming smaller as they are more remote. The average contributions of each separate ancestor to the heritage of the child were determined apparently within narrow limits, for a couple of generations at least. The results assign an average of one quarter from each parent, and one sixteenth from each grandparent. The ratio of filial regression is found to be so bound up with co-fraternal variability, that when either is given the other can be established. The problem of expressing the relative nearness of different degrees of kinship is merely a question of the amount of regression

appropriate to the different degrees. The transmission of acquired faculty should be looked for among grandchildren rather than children. If transmissible at all, it will probably occur with considerable dilution. The law of regression tells heavily against the full hereditary transmission of any gift.

[GALTON, F.] *La Science de la Hérité*. Rev. Sci. xlv, pp. 193-196.
Hints for further research.

— Feasible Experiments on the Possibility of Transmitting Acquired Habits by means of Inheritance. Rep. Brit. Ass. 1889, pp. 620 & 621.

GUYAU, M. *Éducation et Hérité*. Étude Sociologique. Paris: 8vo, xv & 304 pp.

*HANDTMANN, E. Zur Frage über Vererbung erworbener Eigenschaften. CB. Ges. Anthropol. xx, p. 39.

HARTOG, M. M. The Inheritance of Acquired Characters. (Letter to) Nature, xxxix, pp. 461 & 462.

*HIS, W. Ueber das menschliche Ohrläppchen und über den aus einer Verbildung desselben entnommenen Schmidt'schen Beweis für die Uebertragbarkeit erworbener Eigenschaften. CB. Ges. Anthropol. 1889, pp. 17-19, 1 fig.

ISCHIKAWA, C. [See Reproduction.]

In the regeneration of *Hydra*, the new ectoderm is formed from ectoderm only, by means of the intermediary cells, which never form endoderm. An excised part of body always forms head at anterior end.

ISRAEL, O. Angeborene Ohrläppchenspalte. Verh. Anat. Ges. iii, pp. 124 & 125.

LENDL, A. Hypothese über die Entstehung von Soma- und Propagationszellen. Berlin: 8vo, v & 78 pp., 16 figs.

The possible and probable origin of the somatic and the reproductive cells, and their respective relations to the problems of heredity.

LESSER, E. Beitrag zur Vererbung der Hypospadie. Virchow's Archiv. cxvi, pp. 537-539, 1 pl.

LEVY, —. Ueber Erbllichkeit des Vorhautmangels bei Juden. T. c. pp. 539 & 540.

LITHGOW, R. A. D. Heredity: a Study; with special reference to Disease. London: 8vo, 247 pp.

*MANTEGAZZA, P. L'Eredità delle Lesione Traumatiche e dei Caratteri acquisiti dall' Individuo. Studi ed esperienze. Archivio per l'Anropologia, xix, pp. 391-407.

MERRIFIELD, F. Incidental observations in Pedigree Moth-Breeding (*Selene illustratu*). P. E. Soc. 1889, pp. 79-97.

MITCHELL, C. PITFIELD. The Inheritance of Injuries. (Letter to) *Nature*, xl, pp. 391 & 392.

MIVART, ST. GEORGE. Professor Weismann's Hypotheses. *Dublin Rev.* xliv, pp. 269-296.

— . Professor Weismann's "Essays." *Nature*, xli, pp. 38-41.

"*Nature*." The Inheritance of Acquired Characters. Letters by E. RAY LANKESTER, W. J. SOLLAS, J. JENNER WEIR. *Op. cit.* xxxix, pp. 485 & 486.

*NICOLUCCI, G. Eredità ed Atavismo Anomalo. *Napoli*, i, pp. 129-137.

*ORNSTEIN, B. Ein Beitrag zur Vererbungsfrage individuell erworbener Eigenschaften. *CB. Ges. Anthropol.* xv, pp. 49-53.

OSBORN, H. F. The Palaeontological Evidence for the Transmission of Acquired Characters. *Am. Nat.* xxiii, pp. 561-566; *Rep. Brit. Ass.* 1889, pp. 621-623.

POULTON, E. B. Theories of Heredity. *Mid. Nat.* xii, pp. 245-258 [*cf.* pp. 276 & 277], 1 pl.

Chiefly expository.

— . Heredity in Cats with an extra number of Toes. *Rep. Brit. Ass.* lviii, 1889, p. 707.

— . [See WEISMANN, A.]

Revue Scientifique. Enquête sur l'Hérédité, *passim*; Malformations héréditaires (MAREY); Le Pied et la Taille (H. DE PARVILLE); Anomalie héréditaire des Doigts (R. BLANCHARD); Anomalie héréditaire des Doigts et des Orteils (PARIS); Hérédité de la ressemblance (CH. R.); Malformation héréditaire des Orteils (B.); L'hérédité des Grossesses Gémellaires (BOUGON); *Rev. Sci.* xliii, pp. 605, 634, 667, 668, & 669. Hérédité de la ressemblance (G. BARDEY, p. 732); Malformation héréditaire des Doigts (W. LEWENTHAL, p. 763); L'hérédité des Signes anormaux (E. PASCAL, xliv, p. 156); Transmission héréditaire de l'Immunité vaccinale (BOUGON, p. 412); L'hérédité des Vices de conformation des Doigts (p. 443); L'hérédité de l'Ectrodactylie (BOINET, pp. 539 & 540); Comment on devient gaucher (C. COSMOVICI, pp. 572 & 701); La Gaucherie acquise (CH. FÉRÉ & J. H., pp. 605 & 606).

ROSENTHAL, J. Zur Frage der Vererbung erworbener Eigenschaften. *Biol. Centralbl.* ix, pp. 510-512.

RYDER, J. A. [See *Evolution*.]

Some notes on Weismann's opinions.

*SCHMIDT, E. Ueber Vererbung individuell erworbener Eigenschaften. *CB. Ges. Anthropol.* xx, No. 6.

STANLEY, H. M. Mr. Galton on Natural Inheritance. (Letter to) *Nature*, xl, pp. 642 & 643.

Mr. Galton's results stand as the expressions of the law of the frequency of error applied to qualities which are the effect of many complex causes besides heredity.

THOMSON, J. ARTHUR. *The History and Theory of Heredity*. P. R. Soc. Edinb. xvi, pp. 91-116.

Historical and bibliographic, with criticism of Weismann's denial of the inheritance of individually acquired characters. The criticism partly refers to: (1) apparently contrary cases, (2) pathological inheritance, (3) the general theory of evolution, but especially to the general physiological facts which seem against the theory of a germ-plasma unmodifiable by changes in the "soma."

TURNER, W. Presidential Address, Section H. (Anthropology) British Association, 1889. *Nature*, xl, pp. 526-533; *Rep. Brit. Ass.* pp. 756-771.

Historical and critical, with some arguments against Weismann's position.

VILMORIN, H. L. DE. *L'Hérédité chez les Végétaux*. *Rev. Sci.* xliv, pp. 481-493, 20 figs.

VINES, S. II. *An Examination of some Points in Prof. Weismann's Theory of Heredity*. *Nature*, xl, pp. 621-626.

VRIES, H. DE. *Intracellulare Pangenesis*. Jena: 8vo, 212 pp. [*Cf. Biol. Centralbl.* ix, pp. 545-550.]

The entire protoplasm is made up of "pangenes" as diverse as the characteristics of the organism are numerous. So many remain within the nuclei, so many pass out into the cell-substance, there uniting with other "pangenes," multiplying, and becoming active in the functioning of the cell. With this pangenetic conception, the modern conception of germinal continuity is combined, for the author recognizes regular successions of cells, "from the fertilized egg-cell through the individual to the following generation," distinguishing primary and secondary courses or tracks, of which the former run direct from germ-cell to germ-cell, while the latter are circuitous, giving the organism in many cases the power of asexual multiplication. Scholarly historical treatment.

WALDEYER, W. [See Cell.]

WALLACE, A. R. [See Evolution.]

A chapter in this work is devoted to some new illustrations of the non-inheritance of acquired characters, and an argument to show that the effects of use and disuse, even if inherited, must be overpowered by natural selection.

——. *Lamarck versus Weismann*. (Letter to) *Nature*, xl, pp. 619-620.

In reference to eyes in flat-fish, &c.

WEISMANN, A. *Essays upon Heredity and kindred Biological Problems*. Authorised translation by E. B. POULTON, S. SCHÖNLAND, A. E. SHIPLEY. Oxford: 8vo, x & 455 pp.

The Duration of Life; On Heredity; Life and Death; The Continuity of the Germ-plasm as the foundation of a Theory of Heredity; The Significance of Sexual Reproduction in the Theory of Natural Selection; On the Nature of Polar Bodies and their Significance in Heredity; On the Supposed Botanical Proofs of the Transmission of Acquired Characters; The Supposed Transmission of Mutilations.

[WEISMANN, A.] Ueber die Hypothese einer Vererbung von Verletzungen. Tag. 61 Deut. Nat. Vers. pp. 45-58. Jena: 8vo, 52 pp. Summary by P. C. M.; *Nature*, xl, pp. 303 & 304.

Translated along with the other essays.

WILCKENS, M. Ueber die Vererbung der Haarfarbe und deren Beziehung zur Formvererbung bei Pferden. *Biol. Centralbl.* ix, pp. 223 & 224; *Landwirthschaft. JB.* xvii, pp. 555-576.

°ZIEGLER, E. Die neuesten Arbeiten über Vererbung und Abstammungslehre und ihre Bedeutung für die Pathologie. *Beitr. path. Anat.* iv, Heft. 4.

(c.) SPECIAL SUBJECTS.

1. *Cell and Protoplasm.*

Among numerous important researches and papers, those of FROMMANN, HIERING, HOFER, KORSCHULT, PFEFFER, PLATNER, RABL, and BURDON SANDERSON, may be especially noted.

ALTMANN, R. Die Struktur des Zellkerns. *Arch. Anat. Phys.* 1889, pp. 409-411, 1 fig.

°——. Zur Geschichte der Zelltheorien. Leipzig: 8vo, 20 pp.

BALLOWITZ, E. Fibrilläre Struktur und Kontraktilität. *Verh. Anat. Ges.* iii, pp. 121-124.

BARBACCI, O. Sui Fenomeni della Scissione Nucleare indiretta negli Epiteli di Rivestimento. *Atti (Rend.) Acc. Rom.* v, pp. 385-387.

——. Sur les Phénomènes de la Scission Nucléaire indirecte dans les Épithéliums de Revêtement. *Arch. Ital. Biol.* xii, pp. 134-137.

Indirect nuclear division persists, probably intermittently, in all the investing epithelia of guinea-pig, rabbit, and dog.

BELLONCI, G. Intorno alla Divisione diretta del Nucleo. *Mem. Acc. Bologn.* ix (1888) pp. 317-328, 1 pl.

BÉRARD, E. [See CORIN, G.]

°BIANCHI, ST. Alcune particolarità della Cariocinesi studiate negl' Inviluppi Fetalì dei Mammiferi. Parma: 8vo, 12 pp.

BOKORNY, TH. Ueber "Aggregation." *SB. Soc. Erlangen*, xxi, pp. 77-79.

°BRASS, A. Die Zelle, das Element der organischen Welt. Leipzig: 8vo, viii & 224 pp., 75 figs.

BÜTSCHLI, O. Ueber die Struktur des Protoplasmas. Verh. Ver. Heidelb. iv, pp. 423-435; Nachtrag, p. 441.

The structure of protoplasm is strictly vacuolar. This is ingeniously mimicked by artificial cells, composed of fine foams, emulsions, &c., some of which showed not only "network," "knots," and "microsomata," but a stability for as long as two months, a fine limiting membrane, and streaming movements.

— Review by J. H. List. Biol. Centralbl. ix, pp. 560-563.

— Devons-nous admettre un Accroissement de Plasma par Intussusception? Bull. Sci. Fr. Belg. xx, pp. 145-149.

— Protozoa in Bronn's Klassen und Ordnungen, pp. 1713-1840.

See *Protozoa*; but of general import are the author's discussions of regeneration, movement, digestion, &c.

— Protozoa in Bronn's Klassen und Ordnungen, pp. 1841-2035, pls. lxxvi-lxxix.

See *Protozoa*; but the conclusion of this monumental work deserves special record here.

°CELLI, —, & GUARNIERI, —. Riforma Medica, 1888, Nos. 208 & 236. CB. Bakt. Parasi. v, pp. 91-93.

The intimate structure of the plasmodium malarie and its processes of reproduction.

CLARK, J. Protoplasmic Movements and their Relation to Oxygen Pressure. P. R. Soc. xlv, pp. 370 & 371.

Results of experiments made to ascertain the minimum pressure of oxygen necessary to restore the streaming amœboid and ciliary movements of protoplasm after they have come to rest in the absence of that gas.

CORIN, G., & BÉRARD, E. Contribution à l'Étude des Matières Albuminides du Blanc d'Œuf. Arch. Biol. ix, pp. 1-16.

°CUBONI, G. Un nouveau Corps Cellulaire. J. Microgr. xiii, No. 2.

°DEBIERRE, CH. Histologie. Dict. encycl. sci. méd. xiv, pp. 162-181.

DEMARBAIX, H. Division et Dégénérescence des Cellules Géantes de la Moëlle des Os. Cellule, v, pp. x & 25-59, 2 pls.

DENYS, J. Quelques remarques à propos du dernier travail d'Arnold sur la Fragmentation Indirecte. T. c. pp. 159-173, 1 pl.

DREYER, F. Betrachtungen über den Bau der Rhizopodenschalen. Biol. Centralbl. ix, pp. 333-352. Trans., Ann. N. H. iv, pp. 200-319.

Some general considerations on the laws of growth, as illustrated in Rhizopod shells.

FELIX, W. Ueber das Wachsthum der quergestreiften *Musculatur* nach Beobachtungen am Menschen. *Z. wiss. Zool.* *xlvi*, pp. 224-259, 2 pls.

By the third month in the human embryo, all the muscle-fibres of the embryonic type have been formed; after this, increase in number is solely due to the longitudinal division of the fibres already formed.

FLEMMING, W. Amitotische Kernteilung im Blasenepithel des Salamanders. *Arch. mikr. Anat.* *xxxiv*, pp. 437-451, 1 pl.; *Verh. Anat. Ges.* *iii*, pp. 12 & 13.

FROMMANN, C. Beiträge zur Kenntniss der Lebensvorgänge in tierischen Zellen. *Jen. Z. Nat.* *xxiii* (n.f. *xvi*), pp. 389-412, 1 pl.

Ova of *Strongylocentrotus lividus*; formation of radiating figures in the fertilised ovum; formation and degeneration of the network in the grey substance of the brain of *Torpedo*, &c.

GEHUCHTEN, A. VAN. L'Axe Organique du Noyau. *Cellule*, *v*, pp. 177-185, 1 pl.

The nuclear elements (in glandular cells) are disposed in relation to an axis—"the organic axis of the nucleus."

— Les Noyaux des Cellules Musculaires Striées de la Grenouille Adulte. *Anat. Anz.* *i*, pp. 52-64, 14 figs.

Around the nuclei of frog muscle, there is no residue of undifferentiated protoplasm. Besides the nucleoli described by various observers, the nuclei contain a chromatin filament rolled round the internal surface of the nuclear membrane.

— Cellules Musculaires Striées ramifiées et anastomosées. *Verh. Anat. Ges.* *iii*, pp. 100-106, 5 figs.

GEDOELST, L. Nouvelles recherches sur la Constitution Cellulaire de la Fibre Nerveuse. *Cellule*, *v*, pp. 127-154, 1 pl.

*GRIESBACH, —. Ueber Methoden zur Erforschung der chemischen Beschaffenheit des Zellkernes. *Münch. med. Wochenschrift.* *xxxvi*, pp. 732-734.

GRIFFITHS, A. B. A Method of Demonstrating the Presence of Uric Acid in the Contractile Vacuoles of some Lower Organisms. *P. R. Soc. Edinb.* *xvi*, pp. 131-135.

GROBBEN, C. Ueber Arbeitstheilung. *Wien*: 8vo, 24 pp.
Dealing especially with change of function in cells.

*GRUNDTVIG, F. TH. V. Livskraften; en Hypothese om dens inderste Vaesen og Arbejde. *Kjøbenhavn*: 8vo, 44 pp.

*GUARNIERI, —. [Sec *CELLI*, —.]

HARTOG, M. M. Preliminary Note on the Functions and Homologies of the Contractile Vacuole in Plants and Animals. *Rep. Brit. Ass.* *lviii* (1889), pp. 714-716; *Ann. N. H.* *iii*, pp. 64-66.

All naked protoplasmic bodies living in fresh water have at least one

contractile vacuole ; this degenerates on the formation of a strong cell-wall or cyst ; is absent in *Opalina*, Gregariines, Radiolarians, &c., in saline liquids. When its activity is arrested, vacuolation and diffuence set in. Homology of contractile vacuoles and perforations of nephridial cells.

[HARTOG, M. M.] On Adelphotaxy, an undescribed form of Irritability. Ann. N. H. iii, pp. 66 & 67.

Adelphotaxy, or the tendency of spontaneously mobile cells to assume definite positions with regard to their fellows, as seen, *e.g.*, in cellular aggregations in the animal embryo, formation of spermatophores, &c.

HASWELL, W. A. A Comparative Study of Striated Muscle. Q. J. Micr. Sci. cxviii, pp. 31-35, 2 pls.

There are two principal types of striated muscle in the animal kingdom, the simple and the compound—which are not in any way genetically related to one another. Each compound striated fibre is derived from a bundle of simple non-striated fibres. Its simplest forms have only a single transverse network running through a zone of singly refracting substance situated at about the middle of the fibre, with two double refracting zones, one on either side of it. In higher stages the fibres present from 3-20 transverse networks.

HAYCRAFT, J. BERRY, & CARLIER, E. W. Note on the Transformation of Ciliated into Stratified squamous Epithelium as a result of the Application of Friction. P. R. Soc. Edinb. xvi, pp. 119 & 120.

•HERING, E. Vorgänge in der lebendigen Substanz. Lotos, xi, pp. 35-70.

HILLEMAND, C. Introduction à l'Étude de la Spécificité Cellulaire chez l'Homme. Thèse. Paris : 8vo, 90 pp.

The cells may be classified in genera, species, varieties.

HOFER, BRUNO. Experimentelle Untersuchungen über den Einfluss des Kerns auf das Protoplasma. Jen. Z. Nat. xxiv, pp. 105-176, 2 pls. [*Cf.*, °SB. Ges. Morph. v, pp. 52-63.]

Movement of the cell-substance and secretion of digestive juices are possible only when nucleus and protoplasm work together.

JANSE, J. M. Die Permeabilität des Protoplasma. Versl. Ak. Amst. iii, p. 332.

KORSCHULT, E. Beiträge zur Morphologie und Physiologie des Zellkerns. Zool. Jahrb. iv, pp. 1-154, 6 pls.

The morphology and physiology of the nuclei of ovarian and secreting cells. The nucleus is active not only in division, but during other functions. Processes of the nucleus are often directed to the most active part of the cell. The nuclear and cell substances often mingle ; the separation is more apparent than real. The movements of the nucleus and its changes in size and form are also discussed as corroborations of its dominant activity.

°[KORSCHULT, E.] Ueber die wichtigen Funktionen der Wanderzellen im tierischen Körper. Berlin : 8vo, 13 pp., 10 figs.

°KOSSEL, A. Ueber die chemischen Eigenschaften des Zellkerns unter normalen und pathologischen Verhältnissen. Wiener med. Wochenschrift. xxxix, pp. 974 & 975. [*Cf.* Berliner klin. Wochenschrift. xxvi, No. 19 ; CB. med. Wiss. No. 23 ; &c.]

LACAZE-DUTHIERS, H. DE. Vitalité des Tissus chez l'*Amphioxus*. Arch. Z. expér. vi, pp. 43 & 44.

LEYDIG, F. Bemerkungen zum Bau der Nervenfasern. Biol. Centralbl. ix, pp. 199-204.

In ganglionic cells and nerve fibres, the supporting spongioplasm must be distinguished from an enclosed homogeneous hyaloplasm—the true nervous substance. So in muscles the framework and the inclosed homogeneous fluid material—the contractile substance—must be kept distinct.

LIST, J. H. Ueber den feineren Bau Schleim sezernierender Drüsenzellen, nebst Bemerkungen über den Sekretionsprozess. Anat. Anz. iv, pp. 84-94.

LOEW, O. Chemische Bewegung. Biol. Centralbl. ix, pp. 489-498.

°LOOS, A. Ueber die Beteiligung der Leukocyten an dem Zerfall der Gewebe im Froschlärvenschwanz während der Reduktion desselben. Ein Beitrag zur Phagocytenlehre. Habilitationsschrift. Leipzig : 8vo, 28 pp.

MINGAZZINI, F. Contributo alla Conoscenza della Fibra Muscolare Striata. Anat. Anz. iv, pp. 742-750, 4 figs.

MITROPHANOW, P. J. Ueber Zellgranulationen. Biol. Centralbl. ix, pp. 541 & 542.

MORPURGO, B. [See Environment.]

Indirect division persists, though less actively, even during acute inanition.

NISSL, —. Ueber den Zusammenhang von Zellstruktur und Zellfunktion in der centralen Nervenzelle. Tag. Deut. Nat. Vers. lxi, pp. 194 & 195.

NUSSBAUM, M. Ueber Lebenserscheinungen bei den Infusorien. SB. niederrhein. Ges. xlv, pp. 3-5.

Observations relating to the conclusions of Maupas, Weismann, &c.

PENARD, E. Étude sur quelques Hélozoaires d'Eau Douce. Arch. Biol. ix, pp. 123-160 & 161-183, 2 pls.

PFEFFER, W. Beiträge zur Kenntniss der Oxydationsvorgänge in lebenden Zellen. Abh. sächs. Ges. xv, pp. 375-518.

Chiefly dealing with the cells of plants, but obviously of general importance.

°[PFEFFER, W.] Ueber Oxydationsvorgänge in lebenden Zellen. B. r. Bot. Ges. vii, pp. 82-89.

°PIERSOL, G. A. A Half Century of Histology. Univ. Med. Mag. Philadelphia, vol. i (1888-89), pp. 82-87.

PLATNER, G. Beiträge zur Kenntniss der Zello und ihrer Theilungserscheinungen. Arch. mikr. Anat. xxxiii, pp. 125-152, 2 pls.

Beitr. I. Zelltheilung und Samenbildung in der Zwitterdrüse von *Limax agrestis*, pp. 125-134. Beitr. II. Samenbildung und Zelltheilung bei *Paludina vivipara*, pp. 134-145. Beitr. III. Die direkte Kerntheilung in den Malpighischen Gefässen der Insekten, pp. 145-152.

— Die Entstehung und Bedeutung der Nebenkern im Pankreas, ein Beitrag zur Lehre von der Secretion. Beitr. IV. T. c. pp. 180-192, 1 pl.

The accessory nuclear body or "*Nebenkern*" in secretory cells of pancreas, &c., is eliminated from the nucleus, seems to have a genuine secretory significance, for it appears as the active secretion acts in, undergoes retrogressive metamorphosis, and disappears.

— *Ibid.* Beitrag, v. [See Spermatogenesis.]

The importance of the "*centrosoma*" as a cell-centre.

— *Ibid.* Beitrag, vi. [See Oogenesis.]

POUCHET, G. Du Cytoplasme et du Noyau chez les Noctiluques. C. R. cix, pp. 706 & 707.

RABL, C. Ueber Zelltheilung. Anat. Anz. iv, pp. 21-30, 2 figs.

Description of the numerous achromatin threads which run from the chromatin elements to the poles, as division begins. The spindles thus formed become evident only as the nuclear membrane disappears, and disappear as the membrane is restored, a fact which suggests some genuine connection between the two. Even beside a resting nucleus, the "*polar corpuscle*" was detected. All the formed elements of the cell are disposed in relation to this body. The phenomena of division represent a contraction of the formed elements, inaugurated by the division of the "*polar corpuscle*" and its surrounding "*attraction sphere*." In all cells the attraction sphere is presumably present.

— Ueber die Principien der Histologie. Verh. Anat. Ges. iii, pp. 39-62.

°REITTERER, E. Protoplasma. Dictionnaire encycl. sc. méd. Paris : xxvii, pp. 561-604.

RYDER, J. A. Karyokinesis in larval *Amblystoma*. Am. Nat. xxiii, pp. 827-829.

The clearness of karyokinetic processes in the cells of the larval *Amblystoma*.

BURDON-SANDERSON, J. S. Presidential Address Section D Brit. Ass. 1889. Rep. Brit. Ass. pp. 604-614; Nature, xl, pp. 521-526.

Inter alia, discussion of protoplasmic physiology, anabolism and katabolism, &c.

TANGI, F. Ueber das Verhältniß zwischen Zellkörper und Kern während der mitotischen Teilung. *Math. Nat. Ber. Ung.* vi, pp. 61-77, 1 pl.

The sharp boundary between the nucleus and the cell-body disappears during mitosis, when the achromatin nuclear membrane is destroyed.

THOMSON, J. A. Article "Cell." *Chambers's Encyclopædia*, iii, pp. 46-53, 9 figs.

VERWORN, M. *Psycho-physiologische Protisten-Studien. Experimentelle Untersuchungen.* Jena : 8vo, viii & 218 pp., 6 pls., 27 figs. Review by G. J. ROMANES, *Nature*, xl, pp. 541 & 542.

Phenomena of movement ; response to stimuli of many kinds ; psychical phenomena and their evolution.

ZACHARIAS, E. Ueber Entstehung und Wachstum der Zellhaut. *JB. wiss. Bot.* xx, pp. 107-133, 3 pls. ; *Tag. Deut. Nat. Vera.* lxi, pp. 42 & 43.

WALDEYER, W. Karyokinesis and its Relation to the Process of Fertilisation. Trans. by W. B. BENHAM. *Q. J. Micr. Sci.* cxviii, pp. 159-214 ; cxix, pp. 215-281, 1 pl.

See also Oogenesis.

2. *Oogenesis (including the origin, maturation, and fertilisation of the ovum).*

Of most general import appear to be the researches and essays of BLOCHMANN, BOVERI, GIARD, KORSCHULT, MINOT, PLATNER, RYDER, WEISMANN, and ISCHIKAWA. The translation of WALDEYER's memoir and the essay of WINDLE supply valuable historical summaries.

ANDREWS, E. A. Reproductive Organ of *Phuscolosoma gouldii*. *Zool. Anz.* xii, pp. 140-142.

Description of the origin of the germ-cells.

BENEDEN, E. VAN. Monsieur Guignard et la Découverte de la Division Longitudinale des Anses Chromatiques. *Arch. Biol.* ix, pp. 485-495.

BÉRARD, E. [See CORIN, G.]

*BLOCH, H. Ueber electromotorische Erscheinungen am bebrüteten Hühnerei. Inaug. Dissert. Königsberg : (1888) 8vo, 34 pp.

BLOCHMANN, F. Ueber die Zahl der Richtungskörper bei befruchteten und unbefruchteten Bienen-eiern. *Morph. JB.* xv, pp. 85-96, 1 pl.

The unfertilised eggs of the honey-bee form two polar nuclei by two successive divisions. On this account some criticism of Weismann's theory of parthenogenesis.

[BLOCHMANN, F.] Les Globules Polaires chez les Œufs d'Insectes se développant sans Fécondation. Bull. Sci. Fr. Belg. xx, pp. 93 & 94.

——. Ueber die Richtungskörper bei unbefruchteten sich entwickelnden Insekteneiern. Verh. Ver. Heidelb. iv, pp. 239-242.

BOVERI, TH. [See Heredity and also Sex & Reproduction.]

CERMENTATI, M. L'Uovo e le sue prime Trasformazioni. Lecco: 8vo, 46 pp.

CORIN, G., & BÉRARD, E. Contribution à l'Étude des Matières Albuminoïdes du Blanc d'Œuf. Arch. Biol. ix, pp. 1-16.

CUNNINGHAM, J. T. Studies of the Reproduction of Teleostean Fishes occurring in the neighbourhood of Plymouth. J. Mar. Biol. Ass. i, pp. 10-54, 6 pls.

Inter alia: a hypothesis concerning oil-globules in pelagic Teleostean ova. "The excess of oil in the tissues of the parents extends into the ovum, and during the development of the latter supplies the embryo with an abundance of fat, which is necessary to its constitution."

——. Remarks on some Teleostean Ova and their Development. Rep. Brit. Ass. lviii, 1883, pp. 703 & 704.

DAVIDOFF, M. VON. Untersuchungen zur Entwicklungsgeschichte der *Distaplia magnilarra*, Della Valle, einer zusammengesetzten Ascidie. MT. z. Stat. Neap. ix, pp. 113-178, 2 pls.

The so-called "egg" of the Ascidians is an ooblast, which produces ova, of which only one is capable of fertilisation, the others aborting as testacella. The nuclei are buds of the ooblast nucleus. Details as to the behaviour of germinal vesicle and nucleolus. Bütschli's hypothesis that polar globules are rudimentary eggs is supported.

EDWARDS, C. L. Notes on the Embryology of *Muelleria agassizii*. Johns Hopk. Univ. Circ. viii, p. 37.

The ova of this Holothurian extrude three polar globules, one considerably larger than the others.

FLEMMING, W. Das Ei von *Ascidia canina*. Verh. anat. Ges. iii, pp. 13 & 14.

FROMMANN, C. [See Cell]

GARNAULT, P. Sur les Phénomènes de la Fécondation chez l'*Helix aspersa* et l'*Arion empiricorum*. Zool. Anz. xii, pp. 10-15 & 33-38.

°GARNAULT, MARIE F. H. P. Contribution à l'Étude de la Morphologie de l'Œuf et du Follicle. Thèse. Paris: 4to, 38 pp., 2 pls.

GIARD, A. Sur la Signification des Globules Polaires. Bull. Sci. Fr. Belg. xx, pp. 95-103.

The formation of polar globules is an ontogenetic recapitulation of the Protozoan stage.

[GIARD, A.] Sur les Formations Homologues des Globules Polaires chez les Infusoires ciliés. C.R. Soc. Biol. i (ix), pp. 704-709.

HENKING, H. Ueber die Bildung von Richtungskörpern in den Eiern der Insekten, und deren Schicksal. Nachr. Ges. Götting. pp. 444-449.

Formation of first and second polar globules in *Pyrrhocoris apterus*. They seem to be taken up again by the egg. Expulsion of one polar globule in *Tenebrio molitor* and in *Lampyrus splendens*.

—. Ueber die Befruchtung der Eier von *Agelastica alni*, L. Nachr. Ges. Götting. pp. 544-546.

—. Untersuchungen über die ersten Entwicklungsvorgänge in den Eiern der Insekten. 1. Das Ei von *Pieris brassicae*, L., nebst Bemerkungen über Samen und Samenbildung. Z. wiss. Zool. xlix, pp. 503-564, 3 pls.

°HERTWIG, R. Ueber die Gleichwertigkeit der Geschlechtkerne (von Ei und Samenkern) bei den See-Igeln. SB. Ges. Morph. iv, pp. 99-107.

HICKSON, S. J. On the Sexual Cells and the Early Stages in the Development of *Millepora plicata*. Phil. Tr. clxxix, B, pp. 193-204, 2 pls.

HOUSSAY, F. Études d'Embryologie sur l'Axolotl. C.R. cix, pp. 703-706.

ISCHIKAWA, C. [See WEISMANN, A.]

JUNGENSEN, H. F. E. [Teleostei.] [See Reproduction.]

KÖLLIKER, A. v. Das Aequivalent der Attraktionsphären E. v. Beneden's bei *Siredon*. Anat. Anz. iv, pp. 147-155, 3 figs.

Summary of observations on the attraction spheres.

—. Ueber die Mitosen sich furchender Eier des Axolotls. SB. Ges. Würzb. 1889, p. 22.

°—. Mitosen sich furchender Eier. Münch. med. Wochenschr. xxxvi, p. 69.

KORSCHULT, E. [See Cell.]

Inter alia, detailed descriptions of the structure and behaviour of the nuclei in the ovarian cells of *Dytiscus marginalis* and other insects. The general conclusion is that the nucleus plays an active part, and is only apparently separated from the cell-substance.

LANEERE, A. La Réduction Karyogamique dans l'Ovogenèse. Bull. Ac. Belg. xviii, pp. 712-714.

Ovum and spermatozoon undergo a parallel karyogamic reduction, by the expulsion of residual corpuscles.

LENDL, A. [See Heredity.]

Maturation of the ovum compared with that of the sperm; theory of segmentation, &c.

LIEDERMANN, L. Embryochemische Untersuchungen. Math. Nat. Ber. Ung. vi (published 1889), pp. 224-296.

I. Weniger bekannte Bestandteile des Hühnereies. Fett der Hühnereier. Ueber Nuclein. Pp. 224-244. II. Stoffwechsel des bebrüteten Eies bis zur Entwicklung des Hühnchens. Pp. 244-265. III. Arbeiten zur speciellen Chemie des Embryonalleibes. Pp. 265-296.

LIST, J. H. Ueber die weiblichen Geschlechtsorgane und die Eibildung bei parasitischen Copepoden (Gastrodelphyiden). Biol. Centralbl. iv, pp. 327-333.

— Das Genus *Gastrodelphys*. Z. wiss. Zool. xlix, pp. 71-146, 4 pls, 3 cuts.

Inter alia, Oogenesis.

LEWENTHAL, N. Altérations destructives des Ovules Primordiaux. Arch. Sci. Phys. Nat. xxi, p. 168.

— Ueber die Rückbildung der Eizellen und das Vorkommen von Leukocyten im Keimepithel und in den Eischläuchen. Month. Int. J. Anat. Hist. vi, pp. 85-120, 2 pls.

LOWNE, B. THOMPSON. On the Structure and Development of the Ovaries and their Appendages in the Blow-fly (*Calliphora erythrocephala*). J. L. S. xx, No. 123, pp. 418-442, 1 pl.

The author has been led by his observations to conclude that the ovarian eggs in the blow-fly, and probably in other insects, are yolks, and contain no germ. The so-called gum-glands are in reality germ-glands in which the germ-ova are developed. These germ-ova pass into the yolks on their passage through the oviducts as naked germinal vesicles or as female pronuclei.

LUCIANI, L., & PIUTTI, A. Sui Fenomeni Respiratori delle Uova dell Bombice. Bull. Soc. Ent. Ital. xx, pp. 69-99.

The respiratory activity of the ova is lessened by lowering the temperature, by desiccation, and by restricting the space; the relation of the carbonic acid exhaled to the oxygen absorbed is expressed in a fraction increasing to unity, and beyond that as development goes on. There is, therefore, probably an increasing production of less oxygenated molecules.

LUKJANOW, S. M. Einige Bemerkungen über die sexuelle Elemente beim Spulwurm des Hundes. Arch. mikr. Anat. xxxiv, pp. 398-408, 2 pls.

MASSART, J. [Fertilisation of frog ova.] [See Spermatogenesis.]

MINOT, C. S. Segmentation of the Ovum, with especial Reference to the *Mammalia*. Am. Nat. pp. 463-481 & 753-769, 20 figs.

MONDINO, C., & SALA, L. Sur les Phénomènes de Maturation et de Fécondation dans les Œufs des Ascarides. Arch. Ital. Biol. xii, pp. ix-xi.

MORGAN, T. H. Origin of the Test Cells of Ascidians. Johns Hopk. Univ. Circ. viii, p. 63.

In *Cynthia partita*, ova, test-cells, and follicular cells are all homologous, appearing as nuclei in the epithelium of the wall of the oviduct.

NAGEL, W. Ueber das Vorkommen von Primordialeiern ausserhalb der Keimdrüsenanlage beim Menschen. Anat. Anz. iv, pp. 496-498, 2 figs.

NUSSBAUM, W. Bildung und Anzahl der Richtungskörper bei Cirripeden. Zool. Anz. xii, p. 122.

In the ova of the Cirripede *Pollicipes*, one polar globule is formed in the ovary, a second after fertilisation.

PIUTTI, A. [See LUCIANI, L.]

PLATNER, G. Die Bildung der ersten Richtungsspindel im Ei von *Aulastomum gulo*. (Beitr. VI.) Arch. mikr. Anat. xxxiii, pp. 204-216, 1 pl.

The "centrosoma"—a constant characteristic of the cell—divides in the ripe ovum, and the results are surrounded by "archoplasmic spheres." This process introduces the extrusion of the first polar globule.

— Ueber die Bedeutung der Richtungskörperchen. Biol. Centralbl. viii, pp. 718-720.

In the formation of the second polar globule the resting-stage of the nucleus is skipped; the same is observed in the spermatogenesis of *Lepidoptera* and *Pulmonates*. These two parallel and exceptional facts are correlated. "Just as the products of the division of sperm-forming cells are equivalent, so also the nuclei arising from the division of the directive spindle will contain equivalent material."

POUCHET, G. Sur l'Œuf de la Sardine. C.R. cix, pp. 119 & 120.

POUCHET, G., & BIÉTRIX, —. Sur l'Œuf et les premiers Développements de l'Alose. T. c. pp. 951-953.

RETZIUS, G. Die Intercellularbrücken des Eierstockeies und der Follikelzellen sowie über die Entwicklung der Zona pellucida. Verh. Anat. Ges. iii, pp. 10-12.

ROULE, L. Études sur le développement des Annélides et, en particulier, d'un Oligochæte limicole marin (*Enchytraoides marioni*, n.sp.). Ann. Sci. Nat. vii, pp. 107-442, 15 pls.

Inter alia, full description of oogenesis, ova, &c.

RUGE, G. Vorgänge am Eifollikel der Wirbelthiere. Morph. JB. xv, pp. 491-554, 4 pls.

The degeneration of ovarian ova in *Siredon pisciformis* and *Salamandrina atra*, and also in fishes, reptiles, birds, and mammals. The loosening and absorption of the yolk by invading cells, and its passage into the blood. The implication of the whole follicle in the degeneration of the ovum.

RYDER, J. A. The Acquisition and Loss of Food-Yolk, and Origin of the Calcareous Egg-shell. *Am. Nat.* xxiii, 1889, pp. 928-933.

Interpretation of the various ways in which surplus nutriment is elaborated into numerous small eggs, or into fewer and larger ones, or diverted to the embryo itself, &c.

SARASIN, P. & F. [See General and Amphibia.]

*SCHAEFFER, R. Ueber die innere Ueberwanderung des Eies. *Z. f. Geburtshilfe u. Gynäkol.* xvii, pp. 13-43, 1 fig.

°SCHMITZ, J. Experimentelle und histologische Untersuchungen über die Regeneration der Ovarien. *Inaug. Dissert.* Bonn: 8vo, 34 pp.

SEELIGER, O. Ueber die Reifung und Befruchtung des tierischen Eies. *SB. Ges. Königsb.* xxix, pp. 12-14.

SHELDON, L. The Maturation of the Ovum in the Cape and New Zealand species of *Peripatus*. *Q. J. Micr. Sci.* xxx, pp. 1-29, 3 pls.

In *Peripatus capensis* and *P. balfouri* the ova arise apparently from any of the nuclei of the germinal epithelium. Details as to the disappearance of the germinal vesicle, the formation of two polar globules, and the formation of yolk. In *P. novæ-zealandiæ*, the yolk arises in the protoplasm of the ovum itself, from the breaking-up of the germinal vesicle, from the follicle cells, or fourthly from yolk present in the ovary. In this last species, polar globules, as if somehow dependent on the conditions of the yolk, are absent. The similarity of the first and second polar globules in the Cape species is not in accordance with Weismann's interpretation.

TAFANI, A. I primi Momenti dello Sviluppo dei Mammiferi. Studi di Morfologia normale e Patologica eseguiti sulle Uova dei Topi. *Atti (Rend.) Acc. Rom.* v, pp. 119-125. [*Cf. Archiv. d'anatomia*, v, Fasc. 1.]

——. La Fécondation et la Segmentation étudiées dans les Œufs des Rats. *Arch. Ital. Biol.* xi, pp. 112-118.

THOMSON, J. A. Article "Embryology." *Chambers's Encyclopædia*, iv, pp. 317-322, 7 figs.

TOURNEUX, F. Sur les Modifications que subit l'Œuf de la Lapine pendant sa Migration dans l'Oviducte, et sur la Durée de cette Migration. *C.R. Soc. Biol.* i (ix), No. 16, pp. 311-314.

DELLA VALLE, A. Deposizione, Fecondazione, e Segmentazione delle Uova del *Gammarus pulex*. *Atti Soc. Mod. Mem.* viii, 14 pp.

VILLOT, A. Sur l'Ovogenèse, la Structure de l'Ovaire et la Régression du Parenchyme des Gordiens. *C.R.* cix, pp. 411 & 412.

The ova, developed in lateral buds of the ovarian tubes, are simply isolated and modified epithelial cells, and are squeezed into the cavity of the tube when mature.

VOELTZKOW, A. Entwicklung im Ei von *Musca vomitoria*. Arb. Inst. Würzb. ix, pp. 1-48, 4 pls.

—. *Melolontha vulgaris*. Ein Beitrag zur Entwicklung im Ei bei Insecten. T. c. pp. 49-64, 1 pl.

WALDEYER, W. Karyokinesis and its Relation to the Process of Fertilisation. Trans. by W. B. BENHAM. Q. J. Micr. Sci. cxviii, pp. 159-214, 1 pl., and cxix, pp. 215-281.

* —. De la Caryocinèse et de ses Relations avec le Processus de la Fécondation. Arch. zoologie, xvi, pp. 195-221, 276-285, & 424-463.

WATASE, S. On a new Phenomenon of Cleavage in the Ovum of the Cephalopod. Johns Hopk. Univ. Circ. viii, pp. 33 & 34.

Bilateral symmetry in the segmenting ovum of *Loligo pealii*. The nuclei to the left were dividing, while those to the right were resting. Suggestions as to the relation of this to general bilaterality of structure and function.

—. Karyokinesis and the Cleavage of the Ovum. *Op. cit.* ix, pp. 53-56, 2 figs.

The external phenomena of cleavage, and the mechanism of karyokinesis.

WEISMANN, A., & ISCHIKAWA, C. Weitere Untersuchungen zum Zählgesetz der Richtungskörper. Zool. Jahrb. iii, pp. 575-510, 4 pls.

—, & —. Ueber die Paracopulation im Daphnidenei sowie über Reifung und Befruchtung desselben. *Op. cit.* iv, pp. 155-196, 7 pls.

Paracopulation is the presence in the egg of a cell other than the sperm-cell, which at first takes no share in development, but at an early stage in segmentation unites or copulates with one of the cleavage cells. This curious process has been observed more or less clearly in the ova of eight Daphnids. In regard to polar globules, it is pointed out that the occurrence of two polar globules in the unfertilised ova of *Apis* and *Liparis dispar* (?) is no strong objection to Weismann's theory of parthenogenesis, since these two cases are peculiar and not normal illustrations of parthenogenesis.

—, & —. Sur la Fécondation Partielle. Bull. Sci. Fr. Belg., sér. iii, Ann. I, pp. iv-viii.

WHEELER, W. M. The Embryology of *Blatta germanica* and *Doryphora decemlineata*. J. Morph. iii, pp. 291-386, 7 pls., 16 figs. [See *Insecta*.]

Inter alia, emphasis on the genuine persistence of some of the nuclear elements of the germinal vesicle, through the vicissitudes of polar-globule formation and first cleavage. The paths of the pronuclei and cleavage-nucleus. The possible influence of gravitation.

WINDLE, B. C. A. On some Recent Researches in connection with the Maturation, Fertilisation, and Segmentation of the Ovum. P. Birmingham. Phil. Soc. vi, pp. 243-264.

A valuable summary.

ZELINKA, C. Die Gastrotreichen. Eine monographische Darstellung, Biologie und Systematik. Z. wiss. Zool. xlix, pp. 209-384, 5 pls.

Inter alia, the discovery of the ovaries; notable the relatively enormous size of the single mature ovum, which occupies a large part of the body-cavity, crushing the gut and the other ova to the side.

3. Spermatogenesis.

The researches of PLATNER seem to mark the most distinct advance.

BENDA, C. Die Entwicklung des Säugetierhodens. Verh. Anat. Ges. iii, pp. 125-130.

— Die neuesten Publikationen auf dem Gebiete der Samenlehre. Kritische Studien I & II. Internat. Centralbl. Phys. Pathol. d. Harn. u. Sexual-Organen, i, pp. 28-37 & 77-93, 1 pl.

°BEAUDOUNET, U. De la Spermatogénèse dans l'Oblitération de la Vaginale. Thèse. Paris: 8vo.

°BERTACCHINI, P. Sui Fenomeni di Divisione delle Cellule Seminali primitive nella *Rana temporaria*. Rassegna Sc. med. Modena, iv, pp. 138-144.

DRAZZOLA, F. Ricerche sull' Istologia Normale e Patologica del Testicolo. Note II. La Cariocinesi nel Testicolo Normale. Mem. Acc. Bologn. ix, pp. 79-97, 1 pl.

BROWN-SÉQUARD, —. Du Rôle Physiologique et Thérapeutique d'un Suc extrait de Testicules d'Animaux, d'après nombre de faits observés chez l'homme. Arch. Phys. xxi, pp. 739-746.

FERRARI, C. Sulla Spermatogenesi nei Mammiferi. Mem. Acc. Bologn. x, pp. 181-199, 1 pl.; Rend. Ist. Bologna, 1888-89, pp. 118 & 119.

GRANDIS, V. La Spermatogénèse durant l'Inanition. Arch. Ital. Biol. xii, pp. 215-222.

— La Spermatogenesi durante l'Inanizione. Atti Acc. Rom. cclxxxvi, pp. 689-696.

HENKING, H. [*Pieris brassicae*.] [See Oogenesis.]

HERMANN, F. Beiträge zur Histologie des Hodens. Arch. mikr. Anat. xxxiv, pp. 58-106, 2 pls.

[HERMANN, F.] Untersuchungen der Mäuse und Salamander Hoden. SB. Soc. Erlangen, 1883, p. 47. [Cf. Münchener med. Wochenschr. xxxvi. No. 8.]

°HORBATOWSKI, W. Entwicklung der Samenfäden bei der grünen Eidechse. Anz. Ak. Krakau, lix, p. 39.

JUNGENSEN, H. F. E. [*Teleostei.*] [See Reproduction.]

LAMEERE, A. [See Oogenesis.]

LENDI, A. [See Heredity.]

LÖWENTHAL, N. Spermatogénèse chez l'Oxyure de Lapin. Arch. phys. nat. xxi, pp. 449-451.

°——. Die Spermatogenese bei *Oxyuris ambigua*. Month. Int. J. Anat. Hist. vi, pp. 364-391, 1 pl.

MASSART, J. Sur la Pénétration des Spermatozoïdes dans l'Œuf de la Grenouille. Bull. Ac. Belg. xviii, pp. 215-221.

The spermatozoa of the frog are retained by the jelly round the egg ; seek to increase their surface by contact, and that as long as they meet strata of increasing density.

MÜLLER, G. W. Die Spermatogenese der Ostracoden. Zool. Jahrb. iii, pp. 677-727, 2 pls.

The migration of mother-cells into the testicular tubes ; one or two subsidiary nuclei form a tail-piece, often very long and complex ; the spermatozoa consist of a central filament and three connected bands, of which the middle one is contractile.

NELSON, E. M. Some Observations on the Human Spermatozoon. J. Quek. Club, iii, pp. 310-314, 1 pl.

NIESSING, G. Untersuchungen über die Entwicklung und den feinsten Bau der Samenfäden einiger Säugethiere. Verh. Ges. Würzb. xxii, pp. 35-63, 2 pls.

The seminal canals of mature Mammalian testes contain only one kind of cell. These elements are arranged in columnar groups of three generations. Oldest is the stem-cell ; next, the mother- and daughter-cells. The last are first metamorphosed, then the mother-cells, then the growing mother-cells ; but the stem-cells, as such, take no direct part. They regenerate the columns after the spermatozoa of the third stage are completed. The nucleus forms the entire spermatozoon.

°PIERSOL, G. A. The Structure of Spermatozoa, especially those of *Amphiuma tridactylum*. Univ. Med. Mag. Philadelphia, i, pp. 661-669 ; J. R. Mic. Soc. 1890, pp. 309 & 310.

PLATNER, G. Beiträge zur Kenntniss der Zelle und ihrer Theilungserscheinungen. Arch. mikr. Anat. xxxiii, pp. 125-152, 2 pls.

Spermatogenesis in hermaphrodite organ of *Limax agrestis*. The "secondary nucleus" (nebenkern) is ranked with the "sphères attract-

ives" of Van Beneden, "archoplasm" of Boveri, "periplasts" of Vejdovsky. Spermatogenesis in *Paludina vivipara* and *Helix pomatia*. All the constituents of the sperm-producing cells are oriented towards the centrosoma which is contained in the "nebenkern." The tip of the sperm-head is formed from the centrosoma. The "nebenkern" formed from the spindle-fibres after the last division of the spermatocytes shares in forming the covering of the axial filament.

[PLATNER, G.] Samenbildung und Zelltheilung im Hoden der Schmetterlinge. Beitrag v. T. c. pp. 192-204, 1 pl.

The centrosoma of the spermatocyte forms the apex of the spermatozoon; the rest of the head is due solely to the chromatin of the spermatide nucleus; the "nebenkern" formed from the spermatocyte nuclear spindle becomes the sheath of the axial filament. The spermatocytes are homologous with ova; in both the chromatin is reduced to one-fourth of its original quantity by two divisions, the second following the first without the intervention of a resting stage.

— Ueber die Bedeutung der Richtungskörperchen. Biol. Centralbl. viii, pp. 708-720. [Cf. Oogenesis.]

In the testes of *Lepidoptera* there are at first only small cells, which divide frequently and regularly. Suddenly large cells appear, which the author compares with ova. These divide twice, as ova do in forming polar globules.

PRENANT, A. Remarques à propos de la Structure des Spermatozoïdes et du récent travail de Ballowitz. Rev. Biol. i. pp. 299-305.

ROULE, L. [See Oogenesis.]

Development of spermatozoa in *Enchytraeoides*.

VERSON, E. Zur Spermatogenesis. Zool. Anz. xii, pp. 100-102.

In each division of the testis of *Bombyx mori* there is but one giant germinal cell, with numerous peripheral branches. The spermatozoa arise in a somewhat unique fashion.

4. Sex and Reproduction.

Detailed researches of much moment are those of R. HERTWIG and E. MAUPAS on the reproduction of *Protozoa*. The observations of G. W. and E. G. PECKHAM on the sexual selection of spiders deserve special notice. For discussion of general problems, the relevant portions of the works of A. R. WALLACE and A. WEISMANN, the essays of A. LENDL and J. A. BYDER, and the "Evolution of Sex," by P. GEDDES and J. A. THOMSON.

BERTKAU, PH. Ueber proterandrisches Zwittertum im Tierreich. Verh. Ver. Rheinl. xlv, pp. 5 & 6.

BLOCHMANN, F. (Theory of Parthenogenesis.) [See Oogenesis.]

BÖHMIG, L. *Microstoma papillosum*. Zool. Anz. xii, pp. 479–483. [*Cf.* SB. böhm. Ges. 1888 (1889) pp. 304–348, 4 pls.]

In *Microstoma papillosum* the colonies are monœcious ; in all probability asexual reproduction ceases during the sexual process.

BOVERI, TH. Ein geschlechtlich erzeugter Organismus ohne mütterliche Eigenschaften. SB. Ges. Morph. v, pp. 73–80.

BRANDT, A. Anatomisches und Allgemeines über die sogenannte Hahnenfedrigkeit und über anderweitige Geschlechtsanomalien bei Vögeln. Z. wiss. Zool. viii, pp. 101–150, & xl, pp. 151–190, 3 pls.

Analysis of facts and conclusions on genital abnormalities in birds.

BROOK, G. A New Type of Dimorphism found in certain *Antipatharia*. P. R. Soc. Edinb. xvi, pp. 78–83.

The progressive separation of two gonozooids on each side of a gastrozooid.

BÜTSCHLI, O. Bronn's Klassen und Ordnungen des Thierreichs. i. *Protozoa*, pp. 1585–1712.

Division, formation of colonies, conjugation, copulation, &c., of *Protozoa*. [See *Protozoa*.]

CLEISY, A. Recherches des Lois qui président à la Création des Sexes. Thèse. Paris : 8vo, 81 pp.

A valuable essay on the determination of sex.

CUNNINGHAM, J. T. Studies of the Reproduction and Development of Teleostean Fishes occurring in the neighbourhood of Plymouth. J. Mar. Biol. Ass. (n. s.) i, pp. 10–54, 6 pls.

DREYFUS, L. Ueber Phylloxerinen. Wiesbaden : 8vo, 88 pp.

A monographic account of the group, with account of their developmental cycles. [For numerous papers in connection with the reproduction, &c., of *Phylloxera*, *Chermes*, &c., see *Insecta*.]

FLETCHER, J. J. Observations on the Oviposition and Habits of certain Australian Batrachians. P. Linn. Soc. N.S.W. iv, pp. 357–387.

GARNAULT, P. Sur les Phénomènes de la Fécondation chez l'*Helix aspersa* et l'*Arion empiricorum*. Zool. Anz. xi (1888), pp. 731–736, & xii (1889), pp. 10–15 & 33–38.

The sperm excites to segmentation and assures the transmission of characters. The male pronucleus borrows materials from the ovum. The two nuclei of the fecundated ovum are equivalent in mass to the single nucleus of the parthenogenetic nucleus, &c.

—. La Castration Parasitaire chez *Helix aspersa*. Bull. Sci. Fr. Belg. iii, pp. 137–142, 1 pl.

GEDDES, P., & THOMSON, J. A. The Evolution of Sex. London : 8vo, xv & 322 pp., 104 figs.

An outline of the main processes for the continuance of organic life,

with interpretations in terms of the anabolism and katabolism of protoplasm. The sexes and sexual selection; criticism of sexual selection; the determination of sex; sexual organs and tissues; hermaphroditism; the sex-elements; theory of sex; sexual reproduction; theory of fertilisation; parthenogenesis; asexual reproduction; theory of reproduction; special physiology of sex and reproduction; psychological and ethical aspects; laws of multiplication; the reproductive factor in evolution.

°GLAEVEKE, —. Körperliche und geistige Veränderungen im weiblichen Körper nach künstlichen Verluste der Ovarien einerseits und des Uterus andererseits. Arch. Gynäkol. xxxv, pp. 1-89.

GRASSI, B. Ein weiterer Beitrag zur Kenntnis des Termitenreiches. Zool. Anz. xii, pp. 355-361.

Inter alia, the presence of parasitic *Protozoa* seems to be connected with the infertility of workers and soldiers. The problem of the origin of complementary and reserve kings and queens.

GRUBER, A. Biologische Studien an Protozoen. Biol. Centralbl. ix, pp. 14-23.

In response to Maupas: *e. g.*, conjugation may be essential to the immortality of *Protozoa*, but as it always occurs in the natural conditions of life, Maupas' objection is not serious. According to Gruber, the macronucleus consists of histogenetic plasma, the micronucleus of germ-plasma.

HECKERT, G. A. *Leucochloridium paradoxum*. Monographische Darstellung der Entwicklungs- und Lebensgeschichte der *Distomum macrostomum*. Bibl. Zool. iv, 66 pp., 4 pls.

Inter alia—it is always a single cell in the germinal epithelium of the sporocyst-wall which starts a "germ-ball," or a fresh individual; so that Leuckart's comparison of "germ-cell" and ovum is corroborated.

HENKING, H. [Oogenesis (1).]

An appendix discusses Maupas' researches on "le rajeunissement karyogamique."

HÉRON-ROYER, —. Des Causes de la Mortalité des Femelles de Batraciens Anoures à la suite d'un Accouplement prolongé. Bull. Soc. Z. Fr. xiv, pp. 56 & 57.

HERTWIG, R. Ueber die Conjugation der Infusorien. Abh. bayer. Ak. pp. 151-233, 4 pls.

Continued divisions of Infusorians without conjugation end in destruction. When union is artificially prevented, the divisions are continued in the liveliest way until a moment is reached when a replacement of the macronucleus by the products of the accessory nucleus occurs. This self-helping procedure may be repeated several times before the vitality suffers much. But, on the other hand, continued divisions produce a

tendency to conjugation. This seems to have the purpose not of increasing vital energy, but of regulating what is already at a high potential, so that it does not destroy the organism. Hence, in part, the value of cross-fertilisation in these Infusorians.

[HERTWIG, R.] Ueber Konjugation der Infusorien. *SB. Ges. Morph.* v, pp. 35-39.

ISCHIKAWA, C. Trembley's Umkehrungsversuche an *Hydra* nach neuen Versuchen erklärt. *Z. wiss. Zool.* xlix, pp. 433-460, 3 pls., 4 figs.

Hydra turned outside in rights itself by a simple process of folding: an excised portion of the body forms a new head always at anterior end: the intermediary cells only grow into young ectoderm cells, being unable to form endoderm; in swallowing a very large morsel of food, the *Hydra* may turn outside in, but presently rights itself; two individuals may be artificially united in one.

— [See WEISMANN, A. Oogenesis.]

JAWOROWSKI, A. Die Entstehung der Haufen von *Actinophrys sol* durch unvollständige Teilung. *Anz. Ak. Krakau*, 1889, pp. 35 & 36.

JUNGERSEN, H. F. E. Beiträge zur Kenntniss der Entwicklung der Geschlechtsorgane bei den Knochenfischen. *Arb. Inst. Würzb.* ix, pp. 89-219, 2 pls.

Numerous facts in regard to reproductive processes.

— Bidrag til Kundskaben om Kjonsorganernes Udvikling hos Benfiske. *Vid. Medd.* 1889, pp. 101-237, 2 pls.; also, *Kjøbenhavn*: 8vo, 144 pp., 2 pls.

KLEBS, G. Zur Physiologie der Fortpflanzung. *Biol. Centralbl.* ix, pp. 609-617.

LENDL, A. Hypothese über die Entstehung von Soma- und Propagationzellen. *Berlin*: 8vo, 78 pp., 16 figs.

Asexual reproduction, parthenogenesis, origin of conjugation, differentiation of sex, and kindred problems. Full of interesting speculations.

LINDNER, G. [See Environment.]

The female *Anguillula* is among the animals which die soon after reproduction.

LÖW, F. Zur Biologie der Gallenerzeugenden *Chermes* Arten. *Zool. Anz.* xii, pp. 290-293.

The wandering of the first or gall-generation of *Chermes abietis* from the pine to another Conifer, and the division of this generation into two sets, each characterized by a special series of developmental changes.

For further literature on *Chermes*, see *Insecta*.

LUDWIG, H. Berichtigung zu dem von Dr. R. Semon beschriebenen Falle von "Neubildung der Scheibe in der Mitte eines abgebrochen Scesternarmes." *Zool. Anz.* xii, pp. 454-457.

MAUPAS, E. Le Rajeunissement Karyogamique chez les ciliés. Arch. Z. expér. vii, pp. 149-160, 161-320, & 321-517, 15 pls.

Historical introduction ; methods of research ; detailed description of conjugation in 24 species ; special discussion of Vorticellids and *Acinetæ* ; the mitosis of the micronucleus ; conditions and determinant causes of conjugation ; the internal phenomena ; sketch of a general theory of fertilization regarded as a means of rejuvenescence. [See *Protozoa* and *Zool. Rec.* 1888.]

— Sur la Multiplication Agame de quelques Métazoaires inférieurs. C.R. cix, pp. 270-272.

Experiments [unconcluded] on the prolongation of asexual reproduction in Rotifers and *Oligochaeta*. *Cullidina vaga* was followed through twenty-nine generations ; *Chaetogaster diutrophus* through forty-five.

MÉGNIN, P. Observations Anatomiques et Physiologiques sur les *Glyciphagus cursor* et *spinipes*. J. Anat. Phys. xxv, pp. 106-110, 1 fig.

In disadvantageous conditions, *Glyciphagus cursor* and *G. spinipes* encyst remarkably. The organs liquefy, their fused substance is encysted within the otherwise dead body, and may be blown about. In favourable environment, the mass segments, buds, &c., and a new mite emerges.

SAINT-YVES MÉNARD. La Fécondité des Hybrides. Rev. Sci. xlv, pp. 83 & 84. Extrait de la Rev. des Sciences nat. appliquées, 5 July, 1889.

Facts in regard to mules.

MORPURGO, B. [See Environment.]

The reproductive organs exhibited active karyokinesis during inanition of the organism. These organs demand of others a sacrifice of nutrient material.

PARKER, T. JEFFERY. Nomenclature of the Sexual Organs in Plants and Animals. Proc. Austr. Ass. Adv. Sci. 1888, pp. 338-343.

Criticism of R. J. Harvey Gibson's essay "On the terminology of the reproductive organs of plants." Reproductive organ = gonad ; conjugating body = gamete ; product of conjugation = zygote, &c. Classification of the principal modes of sexual reproduction.

PECKHAM, G. W. & E. G. Observations on Sexual Selection in Spiders of the family *Attidae*. Occasional Papers of Nat. Hist. Soc. Wisconsin, i, 1889, pp. 1-60, 3 pls.

An exceedingly careful series of observations. Males are more brilliant than females, but less active and pugnacious. In neither sex is there any relation between development of colour and activity. Good illustrations of elaborate captivating demonstrations by males, and of deliberate selection by females.

PRUVOT, G. Sur la Formation des Stolons chez les Syllidiens. C.R. cviii, pp. 1310-1313.

Details as to the formation and separation of stolons in *Syllidæ* and *Autolytidæ*.

RASPAIL, X. Réflexions au sujet de l'Adoption de l'Œuf du Conçu par les Passereaux. *Bull. Soc. Z. Fr.* xiv, pp. 45-48.

ROUX, W. Ueber die künstliche Erzeugung halber Thiere und über die Nacherzeugung der fehlenden Körperhälfte. *J. Ber. schleswig. Ges.* lxvi, p. 267.

RYDER, J. A. Proofs of the Effects of Habitual Use in the Modification of Animal Organisms. *P. Am. Phil. Soc.* xxvi, pp. 541-549.

"The principle of over-nutrition was at once the cause of sexuality, the struggle for existence, and the direct means of the evolution of all larval forms." "Over-nutrition, resulting in sexuality, was the means of heaping up potential physiological energy in the egg, so as to render larval development and a larval struggle for existence a possibility. The mainspring of evolution or its motive force is to be sought in sexuality."

— . Origin and Meaning of Sex. *Am. Nat.* xxiii, pp. 501-508.

SEELIGER, O. Die ungeschlechtliche Vermehrung der endoprokten Bryozoen. *Z. wiss. Zool.* xlix, pp. 168-208, 2 pls., 6 figs.

The budding is a process of gastrulation repeated by the ectoderm on various regions of the adult animal or of its stolon.

— . Zur Entwicklungsgeschichte der Pyrosomen. *Jen. Z. Nat.* xxiii, pp. 595-658, 8 pls.

Details about the complex life-history (see *Tunicata*).

SEMON, R. Ein Fall von Neubildung der Scheibe in der Mitte eines abgebrochenen Seesternarmes. *T. c.* pp. 585-594, 1 pl.

A remarkable case of disc-regeneration from the broken arm of an Ophiurid; cf. however LUDWIG, H.

SHELDON, L. [See Oögenesis.]

In Cape species of *Peripatus*, the ovary is full of spermatozoa, and the ova are probably fertilised there. In the New Zealand species, spermatozoa are present only in the receptacula seminis.

SKERTCHLY, S. B. J. [See Evolution.]

Observations which tell against the evolutionary import of sexual selection.

SUCHETET, A. La Fable des Jumarts. *Mem. Soc. Zool.* iii, pp. 1-30.

*TESMER, G. Zur Geschichte der Lehre von den Fortpflanzungsarten im Thierreiche. Leipzig: 8vo, 47 pp.

THOMSON, J. A. [See GEDDES, P.]

— . A Theory of the Parasitic Habit of the Cuckoo. *P. Phys. Soc. Edinb.* x, pp. 60-67.

Virtually the same as that in Eimer's "Ursprung der Arten."

*TILLIER, L. L'Instinct sexuel chez l'Homme et chez les Animaux. Précédé d'une préface par J. L. de Launessan. Paris: 12mo, 16 & 300 pp.

VILLOT, A. [See Oogenesis.]

Gordius reproduces only once in a lifetime, and the females die soon after laying eggs.

WAGNER, F. v. Zur Kenntnis der ungeschlechtlichen Fortpflanzung von *Microstoma*. Zool. Anz. xii, pp. 191-195.

WALLACE, A. R. [See Evolution.]

"As a general rule, the colours of the two sexes are alike; but in the higher animals there appears a tendency to deeper or more intense colouring in the male, due probably to his greater vigour and excitability. . . . In most cases there is evidence to show that natural selection has caused the female to retain the primitive and more sober colours of the group for purposes of protection." Male ornament is due to "general laws of growth and development"; it is "unnecessary to call to our aid so hypothetical a cause as the cumulative action of female preference."

WEISMANN, A. [See Heredity.]

WEISMANN, A., & ISCHIKAWA, C. [See Oogenesis.]

ZELLER, E. Ueber die Fortpflanzung des *Proteus anguineus* und seine Larve. JH. Ver. Württ. xlv, pp. 64 & 65 & 131-139, 1 pl.

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MAMMALIA.

BY

R. LYDEKKER, B.A., F.G.S.

THE following table shows the number of new generic and specific names recorded for the year 1889:—

NEW GENERA.	RECENT.	FOSSIL.	NEW SPECIES.	RECENT.	FOSSIL.
56	4	52	230	67	163

In addition to these, eight new generic names have been proposed to replace preoccupied ones which have been applied to fossil forms. One new name has also been proposed to displace an inappropriate one in an existing species.

Besides a number of Micromammalia, it is noteworthy that several new large recent Mammals have been described during the year, among which may be noticed a species of *Sennopithecus*, two Antelopes, and a *Cerrulus*. The new Murine genus *Xeromys* is also an important type added to the existing fauna.

By far the most important event connected with the Mammalogy of the year is the discovery of the existence of functional teeth in *Ornithorhynchus*.

Among the more important works published during the year, reference may be especially made to AMEGHINO'S account of the extinct Mammals of South America, MARSH'S description of the remains of Cretaceous Mammals from the United States, and SCOTT & OSBORN'S Mammalian Fauna of the Uinta Group. BÜCHNER'S Monograph of the Mammals collected by Przewalski has been continued during the year.

I.—THE GENERAL SUBJECT.

ALLEN, J. A. Notes on a Collection of Mammals from Southern Mexico, with Descriptions of New Species of the Genera *Sciurus*, *Tamias*, and *Sigmodon*. Bull. Am. Mus. Nat. Hist. ii, pp. 165–181.

Describes a series of specimens collected during a journey from Tepic across the Sierra de Nayarit and adjoining ranges of the Sierra Madre to Zacatecas—a distance of over 1000 miles. 16 species are recorded, 3 of which are new forms. The list includes a specimen of *Sciurus annulatus*, previously known only by one example, now lost. The range of *Tamias* is extended several hundred miles south of any point hitherto recorded, and 1 new variety of this genus is described from California. [See *Sciuridae* and *Muridae*.]

— [See also *Chiroptera*.]

AMEGHINO, F. Contribucion al Conocimiento de Los Mamiferos Fosiles de la República Argentina. Buenos Ayres: 4to, 1027 pp., 98 pls.

This fine work gives a full description, with figures, of the numerous species of fossil Mammals from Argentina named by the author during the last few years. Space only permits of a notice of the new forms. In the *Muridae* these comprise the new genus *Ptyssophorus*, allied to *Rhithrodon*; a new species of *Oxygnathus*, 1 of *Habrothrix* and *Holochilus*; and the new genus *Bothriomys*, allied to *Habrothrix*, *Tretomys* allied to *Rhithrodon*, and *Necromys*. In the *Hystriidae*, the new genus *Paradozomys*, and a new species of *Acaremys*. In the *Octodontidae*, a new species of *Neoremys*; the new genus *Olenopsis*, with affinity to *Myopotamus* and *Neoremys*; and the new genus *Discolomys*, belonging to the *Echinomyine*. Of the forms allied to *Ctenomys*, we have 1 new species of *Pithanotomys*. In the *Chinchillidae*, we have a new species of *Perimys*, and several of *Lagostomus*. The *Caviidae* include the new genus *Orthomysetera*; new species of *Dolichotis*, *Cerodon*, and *Microcavia*; the new genus *Palaeocavia*; and the name *Neoprocavia*, in place of *Procavia*. *Hydrochaerus paranaensis* is described as *Pleurochaerus*, and a new species of the latter genus proposed. *Mesotherium marshi*, Moreno, is made the type of the genus *Macropristis*, and referred provisionally to the *Macropodidae*. Among the *Multituberculata*, the new name *Epanorthus* is proposed, to replace the preoccupied *Palaeotheres*. 4 new species of *Didelphys* are named, as well as the new genus *Dimerodon*. The *Creodonts* include a new species of *Acyon*. In the *Carnivora* we have a new species of *Cunis*, one of *Mephitis*, and one of *Felis*. The *Toxodontia* include the new name *Eutomodus*, in lieu of the preoccupied *Tomodus*, and the new genus *Eutelmorphus*, allied to *Mesotherium*; as well as new species of *Pachyrhynchus*; the new genera *Icochilus* and *Patriarchus*, and 1 new species of *Protypotherium*. In the *Equidae* there is 1 new species of *Hippidium*; while the new genus *Diplotremus* is referred to the *Cotylopidae* (*Oreodontidae*). The *Camelidae* include 4 new species of *Auchenia*, 1 of *Palaeolama*, and the new genera *Stilauchenia* and *Eulamops*. In the *Cervidae* we have a new species of *Cervus*, and the new genera *Paraceros* and

Epieuryceros. The *Elephantidae* contain a new species of *Mastodon*. Among the *Edentata*, *Delotherium* is a new genus of uncertain position; while *Scotrops* is referred to the *Orycteropodidae*. The family *Megatheriidae* is divided into 6 families; *Neoracanthus* is proposed for the preoccupied *Oracanthus*, and a new species named. Here also we have the new genus *Zamierus*, a new species of *Lestodon*, and one of *Pseudolestodon*. The *Glyptodontidae* include 2 species of *Glyptodon*; the name *Neothoracophorus* is proposed to replace the preoccupied *Thoracophorus*; *Cochlops* is a new name; several new species of *Palaeohoplophorus* and *Hoplophorus* are described; *Lomaphorus* and *Asterontemma* are allied new genera; *Zaphilus* is another new genus; several new species of *Panochthus* are described; and the name *Neuryurus* is proposed to replace the preoccupied *Euryurus*; there is also a new species of *Dedicurus*, and the new genus *Pseudoeuryurus*. The *Dasyppodidae* include a new species of *Dasypus*; while the new genus *Zaedyus* is proposed for the existing *D. minutus*. In the Supplement we have a new genus of Tæniodonts, a new *Myopotamus*, a new *Perimys*, the new genera *Euphilus* and *Briaromys*, allied to *Lagostomus* and *Megamys*, a new species of *Neopiblema*, 1 of *Plexochaerus*, and 1 of *Hydrochaerus*, a new genus of Creodonts, a new species of *Torodontotherium*, 1 of *Palaeolama*, 1 of *Astrapotherium*, and 1 of *Dasypus*. The various new genera and species will be found recorded below.

ANDERSON, J. Report on the Mammals, Reptiles, and Batrachians, chiefly from the Mergui Archipelago, collected for the Indian Museum. J. L. S. xxi, pp. 331-350.

23 species of Mammals are mentioned.

AULD, R. C. [See *Ungulata* and *Boridae*.]

BAGINSKY, B. Ueber den Ursprung und den centralen Verlauf des Nervus acusticus des Kaninchens und der Katze. SB. Ak. Berlin, 1889, pp. 635-639.

Observations on the origin and course of the auditory nerve in the Rabbit and in the Cat.

BARDELEBEN, K. On the Præpollex and Præhallux, with Observations on the Carpus of *Theriodonemus phylarchus*. P. Z. S. 1889, pp. 259-262, pl. xxx.

The author recorded the presence of a two-segmented nail-clad prepollex in *Pedetes*, and that of a two-segmented pisiform (postminimus) in *Bathyergus*. He also stated that he had discovered vestiges of the prehallux and prepollex in certain *Reptilia*. He then passed to the consideration of the Mesozoic *Theriodonemus* of Seeley, and denied the existence of the scapholunar of that author, while he produced good reason for believing the same observer's second centrale to consist of two elements, and his preaxial centrale to be the basal element of a prehallux. The carpus is redescribed and figured. The limb is regarded as indicating an extremely generalized form, showing affinities both with Mammals and Reptiles.

[BARDELEBEN, K.] Präpollex and Prähallux. Verh. Anat. Ges. Berl. 1889, pp. 106–112, woodcuts.

A reproduction of the preceding paper.

BAUR, G. Neue Beiträge zur Morphologie des Carpus der Säugetiere. Anat. Anz. iv, pp. 49–52, woodcuts.

From the evidence of specimens of *Chelemys* and *Chelodina*, where two bones lying distally of the intermedium are regarded as centralia, it is considered that the bone in *Chelydra* usually regarded as the radiale, is really a centrale. From this it is inferred that the Mammalian scaphoid likewise represents a centrale, instead of a radiale; the true radiale being the bone usually termed the radial sesamoid (as in *Cyncephalus*). It is added that the primitive 'heptadactylism' of Mammals is based on a misconception, the prehallux being regarded as the representative of the radiale.

—. [See also *Proboscidea*.]

BEDDARD, F. E. [See *Tapiridae* and *Rhinocerotidae*.]

BENDA, C. Die Entwicklung des Säugethier-hodens. Verh. Anat. Ges. Berl. 1889, pp. 125–130.

An account of the development of the Mammalian testicles.

BIELZ, E. A. Die Fauna der Wirbelthiere Siebenbürgens, nach ihrem jetzigen Bestande. Verh. siebenb. Ver. xxxviii, pp. 15–120 (1888).

The first portion catalogues the Mammals of the districts named.

BOCAGE, J. V. BARBOZA DU. Breves Considerações sobre a Fauna de S. Thomé. J. Sci. Lisb. (2) i, pp. 33–36.

Seven Mammals are recorded from this island, viz., *Cercopithecus mona*, *Viverra civetta*, *Cynonycteris straminea*, *Phyllorhina caffra*, *Mus decumanus*, *M. rattus*, and a new *Crocidura*, which the author proposes to describe as *C. thomensis*.

—. Mammifères d'Angola et du Congo. T. c. pp. 8–32, woodcuts, & pp. 174–185.

These parts are stated to be the first and second of a series of articles illustrative of the Mammals of Angola and the Congo preserved in the Museum at Lisbon. The first part treats of the *Primates*, *Chiroptera*, and some of the *Insectivora*, in which 3 new species of *Crocidura* are described. The second part describes the *Carnivora*. [See *Soricidae*.]

BODINGTON, [MRS.] A. The Mammalia: Extinct Species and Surviving Forms. J. Micr. & Nat. Sci. (2) ii, pp. 33–57, pls. v–vii.

A popular account of some of the chief lines of Mammalian descent.

BOEN, G. Beiträge zur Entwicklungsgeschichte der Säugethierherzens. Arch. mikr. Anat. xxxiii, pp. 281–378, pls. xix–xxii.

A detailed account of the gradual development of the heart of Mammals. [See also RÖSE (p. 13).]

BOULE, M. [See *Canidae*.]

BOURRIT, —. [See *Equidæ*.]

BRANDT, A. [See *Artiodactyla*.]

BREZOL, H. [See *Artiodactyla*.]

BROWNE, M. The Vertebrate Animals of Leicestershire and Rutland. Birmingham & Leicester : 4to, pp. 223, plates.

The recent and fossil Mammals recorded from these counties are noticed. Reviewed in *Nature*, xli, pp. 220 & 221.

BROWN, J. A. HARVIE-, & BUCKLEY, T. E. Fauna of the Outer Hebrides. Edinburgh : 8vo, pp. xciii & 279, illustrated.

BRUSINA, S. [See *Cetacea*.]

BÜCHNER, E. [See *Sciuride* and *Muridæ*.]

BURMEISTER, H. Los Caballos Fósiles de la Pampa Argentina. Suplemento (Die fossilen Pferde der Pampas formation.-Nachtrags-Bericht). Buenos Ayres : 1889, folio, 66 pp., pls. ix-xii.

A continuation of the author's previous memoir on the fossil *Equide* of the Argentine (1875). In the first part, which is devoted to the *Equidæ*, the author justifies the retention of *Hippidium*, and after describing remains of *H. principale* and *H. neogæum*, founds the new species *H. nanum*. In *Equus* remains of *E. curvidens*, *E. argentinus*, and *E. andium* are described, with figures. In the second part a skull of *Megatherium americanum* is described and figured, which shows the presence of a prenasal bone, and also of another ossification from the premaxillæ extending upwards and backwards towards the latter. The skull of *Mastodon cordillerum* (*andium*) is then described and figured, and is shown to have a short edentulous mandibular symphysis, in place of the long-tusked one which had been referred to it by Falconer. The distinctive features of this species, as contrasted with *M. humboldti*, are pointed out. The memoir concludes with a description of the remains of *Macrauchenia patachonica* and *M. parunensis*, and it is considered that there is no justification for the separation of the latter as *Scalibrinitherium*, nor for that of *M. minuta* as *Oxydon*[*to*]therium, according to Ameghino's proposal. This memoir is reviewed in *Nature*, xli, pp. 82-84 (with woodcuts), where it is pointed out that the ossifications in the nasal region of *Megatherium* are a rudiment of the naso-premaxillary arch found in *Mylodon* (*Grypotherium*) *darwini*. [See *Equidæ*.]

CLARK, J. W. [See *Sirenia*.]

CORE, E. D. On the *Mammalia* obtained by the Naturalist Exploring Expedition to Southern Brazil. *Am. Nat.* xxiii, pp. 129-150.

A description of specimens collected by an expedition which left New York in 1882. Altogether 66 species are noticed; the following being described as new, viz. :—*Vesperus arge*, *Myrmecophaga straminea*, *Tatusia megalolepis*, *Sphingurus sericeus*, *Dasyprocta aurea*, *Felis braccata*, and *Dicotyles angulatus*. The new species *Dermanura eva* and *Myrmecophaga sellata* are also described from other localities. [See *Felidæ*, *Vespertilionidæ*, *Phyllostomatidæ*, *Hystericidæ*, *Dasyproctidæ*, *Suidæ*, *Myrmecophagidæ*, and *Dasypodidæ*.]

[COPE, E. D.] Synopsis of the Families of the *Vertebrata*. *T. c.* pp. 274-877.

The subclasses and orders of the *Mammalia* are arranged as follows:—

Subclass. *Prototheria*.

Order. *Protodonta*—*Dromatheriidae*.

Multituberculata—*Plagiaulacidae*, etc.

Ornithostomi—*Echidnidae* and *Ornithorhynchidae*.

Subclass. *Eutheria*.

(a) *Didelphia*.

Order. *Marsupialia*.

(b) *Monodelphia*.

Order. *Cetacea*.

Sirenia.

Edentata.

Glives.

Chiroptera.

Bunotheria.

Carnivora.

Ancylopoda.

Taxeopoda (= *Hyracoidea*, *Toxodontia*, *Condylarthra*, and *Primates*).

Amblypoda.

Diplarthra.

— The Mechanical Origin of the Hard Parts of the *Mammalia*. *T. c.* pp. 71-73 (Abstract), and *J. Morph.* iii, pp. 137-290.

A paper read before the Amer. Phil. Soc., in which the author concludes that the structure of the Mammalian skeleton and dentition may be referred broadly to excess or defect of growth, and that these two series may be subdivided into numerous divisions, which are given in detail.

— The *Vertebrata* of the Swift Current River. *T. c.* pp. 151-155.

In this second notice of the Miocene fauna of the above Canadian river, the author records fourteen species of Mammals, of which several are described as new. *Chalicotherium* is recorded both from these deposits and the Loup Fork group of Kansas. It is considered that this genus should form the type of a distinct order, for which the name *Ancylopoda* is proposed; and it is pointed out that there is no evidence to show that the presumed Edentate genus *Moropus* of the Loup Fork beds is really distinct from *Ancylotherium*, an ally of *Chalicotherium*. In the Perissodactyla the new genus *Haplacodon* is formed for the reception of the so-called *Menodus angustidens*, which turns out to be allied to *Paleosyops*; and a new species of *Anchitherium* is described. Of Artiodactyles, one new species of *Hypertragulus* and two of *Leptomeryx* are named. [See *Chalicotheriidae*, *Lambdotheriidae*, and *Tragulidae*.]

— [See also *Proboscidea*, *Edentata*, and *Equidae*.]

CUNNINGHAM, J. [See *Primates* and *Simiidae*.]

CZERNY, A. Das Giralaldès'sche Organ, nach Untersuchungen an Kaninchen, Hunden und Katzen. Arch. mikr. Anat. xxxiii, pp. 445-461, pls. xxviii & xxix.

Describes the organs of Giralaldès (remnants of the Wolffian bodies) in the Rabbit, Dog, and Cat.

DALLA-TORRE, K. W. v. Die Fauna von Helgoland. Zool. Jahrb. iv. Abth. f. Syst. Suppl. 2, 99 pp.

The few Mammals occurring in the island are mentioned.

DEFÉRET, C. [See *Cercopithecidae*.]

DETMERS, F. The Comparative Size of Blood Corpuscles of Man and Domestic Animals. P. Am. Micr. Soc. ix, pp. 216-221 (1888).

The author draws attention to the necessity of examining a large number of specimens before laying down axioms as to the difference between the blood corpuscles of one Mammal and those of another.

DE VIS, C. W. [See *Nototheriidae*, *Phalangeridae*, and *Macropodidae*.]

DOBSON, G. E. [See *Soricidae*.]

DOLLO, L. Le Vol chez les Vertébrés. Rev. Quest. Sci. 1889, pp. 146-207 & 410-485.

Pp. 184-207 are devoted to Mammals provided with a parachute, and pp. 410-430 to the *Chiroptera*.

—, Sur le Centre du ProAtlas. Bull. Soc. Anthropol. Brux. vii, pp. 241-251, woodcuts.

Describes and figures skulls of *Mucacus*, *Cynocephalus*, and *Canis*, showing a small ossification between the occipital condyles, which is regarded as the centrum of the proAtlas. Concludes with a summary of the evidence in favour of the existence of the proAtlas.

DUVAL, M. [See *Rodentia*.]

EVERETT, E. H. Remarks on the Zoo-geographical Relationships of the Island of Palawan and some Adjacent Islands. P. Z. S. 1889, pp. 220-228, map.

A list of the Mammals found in Palawan—northward of Borneo—is given on p. 223 of this paper, and includes 18 species.

FILHOL, H. [See *Viverridae*, *Canidae*, *Mustelidae*, and *Anthracotheeriidae*.]

FLEISCHMANN, A. [See *Carnivora*.]

FLOWER, W. H. [See *Rhinocerotidae*.]

FRIEDEL, E. [See *Caviidae*.]

FROMMEL, R. Zur Entwicklung der discoidalen Placenta. SB. Soc. Erlangen for 1888, p. 37. Title only.

—, [See also *Chiroptera*.]

GAGE, S. S. P. [Miss]. Ending and Relation of the Muscular Fibres in the Muscles of Minute Animals (Mouse, Mole, Bat, and Sparrow). P. Am. Micr. Soc. ix, p. 207 (1888). [Abstract].

GALIPPE, V. [See *Elephantidæ*.]

GIACOMINI, C. [See *Simiidæ*.]

*GRUBER, W. L. Monographie ueber den Flexor Digitorum brevis pedis und der damit in Beziehung stehenden Plantarmusculatur bei dem Menschen und bei den Säugethiere. St. Petersburg. [Reviewed in Anz. Ak. Wien, 1889, pp. 7-9.]

GÜNTHER, A. [See *Bovidæ*.]

HARVIE-BROWN. [See BROWN.]

HATSCHEK, B. Die paarigen Extremitäten der Wirbelthiere. Verh. Anat. Ges. Berl. 1889, pp. 82-90, woodcuts.

Reference is made to the limbs of Mammals.

HEINRICIUS, G. [See *Canidæ*.]

HELLER, K. M. [See *Bovidæ*.]

HEPBURN, D. The Development of Diarthrodial Joints in Birds and Mammals. P. R. Soc. Edinb. xvi, pp. 258-261.

The conclusions at which the author arrives are summarized at the end of the paper.

HERMANN, F. [See *Muridæ*.]

HERRERA, D. A. L. [See *Chiroptera*.]

HITCHER, C. [See *Bovidæ*.]

HORNADAY, W. T. [See *Bovidæ*.]

HOWES, G. B. Additional observations upon the Intranarial Epiglottis. J. Anat. Phys. xxiii, pp. 587-597.

A continuation of the paper quoted in Zool. Rec. xxv, *Mamm.* p. 37, in which the occurrence of this feature in a number of Mammals belonging to all the orders is recorded. It is considered that the author's original conclusion as to the primitive nature of this feature is supported by the new facts.

HUBBRECHT, A. A. W. Studies in Mammalian Embryology. I. The Placentation of *Erinaceus europæus*, with remarks on the Phylogeny of the Placenta. Q. J. Micr. Sci. xxx, pp. 283-404, pls. xv-xxvii.

This elaborate memoir is divided into several sections. The first treats of the early stages of the development of the Hedgehog, with a sketch of the general development of the yolk-sac and allantois. The second describes the histological modifications in the uterine tissue during pregnancy. The third is devoted to the physiology of the placenta of the Hedgehog. The fourth summarizes recent researches on placentation, and the fifth general conclusions on the same. The appendix compares the terms applied to certain foetal and maternal elements in the placentation of different groups of Mammals. The author concludes that the division of the Placental *Mammalia* into *Deciduata* and *Adeciduata* is not a natural one; and on other grounds considers that these terms should be withdrawn.

HUET, A. [See *Artiodactyla*.]

HUMPHREYS, J. Evolution illustrated by Teeth. J. Brit. Dent. Assoc. 1889, 15 pp.

A remarkable paper, in which the teeth of Tertiary Mammals are said to be compared with those of the present day.

JELGERSMA, G. Ueber den Bau der Säugethiergehirns. Morph. JB. xv, pp. 61-84, pl. iv.

An explanation of the general plan of structure and mutual relations of the component elements of the Mammalian brain.

JENTINK, F. A. [See *Cercopithecidae* and *Pteropodidae*.]

KAFKA, G. [See *Sciuridae*.]

KITTL, E. [See *Suide*.]

KLEVER, E. [See *Equidae*.]

KOHL, C. [See *Talpidae*.]

KRAMER, E. [See *Bovidae*.]

KÜKENTHAL, W. [See *Cetacea*.]

KULCZYCKI, W. [See *Cunidae*.]

LANGKAVEL, B. [See *Bovidae*.]

LATASTE, F. Considérations sur les Deux Dentitions des Mammifères. J. de l'Anat. Phys. xxv, pp. 200-222.

Recapitulates the views of the author as to the relations of the deciduous to the permanent dentition.

— [See also *Rodentia*.]

LAVOCAT, A. Cotes et Sternum des Vertébrés. Mém. Ac. Toulouse (9) i, pp. 39-55.

Pp. 50-53 are devoted to the consideration of the sternum and ribs of Mammals.

LEBOUCQ, H. [See *Cetacea*.]

LECHE, W. [See *Dasyuridae*.]

LEFÈVRE, T. [See *Sirenia*.]

LEIDY, J. Description of Mammalian Remains from a Rock Crevice in Florida. Tr. Wagner Inst. ii, pp. 13-17, pl. iii

Describes various Pleistocene Mammalian remains, comprising those of Horse, Llama, *Machærodus*, and Elephant. A skull of *Machærodus* is made the type of the new species, *M. floridanus*.

— Description of Vertebrate Remains from Peace Creek, Florida. T. c. pp. 19-31, pls. iii-vii, and woodcuts. [See also P. Ac. Philad. 1889, pp. 96 & 97.]

The remains described are of Pleistocene age. The Mammals include a Tapir allied to *Tapirus americanus*, species of *Equus* and *Hipparion*; a Bison, a Deer, *Elephas columbi*, *Chlamydothierium humboldti*, *Glyptodon petaliferus*, *Manatus antiquus*, and Cetaceans.

[LEIDY, J.] Notice of some Mammalian Remains from the Salt Mine of Petite Anse, Louisiana. *T. c.* pp. 33-40, pl. v, fig. 2, woodcuts.

The remains described are referred to *Mastodon americanus*, *Myiodon*, and *Equus*.

— [See also *Suidæ*.]

LENDEFELD, R. Bilder aus dem Australischen Urwald.- Eingeführte Tiere. *Zool. Gart.* xxx, pp. 110-114.

An account of the Mammals and other animals introduced into Australia.

LENHOSSÉK, M. v. Ueber die Pyramidenbahnen in Rückenmärkte einiger Säugethiere. *Anat. Anz.* iv, pp. 208-219, woodcuts.

Describes the structure and relative length of the pyramidal tracts of the spinal cord in the Mouse, Guinea Pig, Rabbit, Cat, and Man.

— [See also *Muride*.]

LIEBE, K. T. [See *Leporidae*.]

LOCARD, A. Catalogue Descriptif des Mammifères qui vivent dans le Département du Rhone et dans les Régions Avoisnantes. *Ann. Soc. L. Lyon* (2) pp. 1-74.

Includes both the wild and tame Mammals found in this district.

LÜTKEN, C. F. [See *Delphinidae*.]

LYDEKKER, R. [See NICHOLSON & LYDEKKER; and *Condylarthra*, *Artiodactyla*, and *Nototheriidae*.]

MARSH, O. C. Discovery of Cretaceous Mammals. *Am. J. Sci.* (3) xxxviii, pp. 81-92, pls. ii-v, & pp. 177-180, pls. vii & viii.

The author describes a series of detached teeth and a few bones from the Laramie Cretaceous, which he refers to a number of distinct genera and species. It is contended that the Mammalian teeth described by Cope as *Meniscoessus*, are not really referable to that genus, of which it is considered that the type is Reptilian. The memoir is criticized in *Am. Nat.* xxiii, pp. 490 & 491, by E. D. Cope, where it is suggested that the number of genera is unnecessarily large, and it is stated *Meniscoessus* was founded upon a Mammalian tooth of the form described in the memoir as *Selenacodon*.

— [See *Marsupialia* and *Multituberculata*.]

MASIUS, J. [See *Leporidae*.]

MEHNERT, E. Untersuchungen über die Entwicklung des Beckengürtels bei einigen Säugethieren. *Morph. JB.* xv, pp. 97-112, pl. vi.

Describes, with illustrations, the development and mutual relationships of the elements of the Mammalian pelvis.

MELI, R. *Castor fiber*, Linn., *Ursus spelæus*, Blum., *Canis lupus*, Linn., fossili nelle ghiaie quaternarie della Valle del Tevere. *Boll. Soc. geol. Ital.* viii, pp. 40-43.

MERRIAM, C. H. The North American Fauna (U. S. Department of Agriculture). No. 1. Revision of the North American Pocket-Mice, pp. 1-29, pls. i-iv. No. 2. Descriptions of Fourteen New Species and One New Genus of North American Mammals, pp. 1-35, pls. i-viii.

In the first of these two memoirs the author gives a revision of the genus *Perognathus*, and shows that *Cricetodipus* is a synonym of the latter. Figures are given of the skulls of a number of species. In the second memoir we have descriptions of 12 new species of Rodents, and 2 of Bats. In the *Muride* the subgenus *Onychomys* of Baird is raised to the rank of a genus, allied to the other white-footed Mice (*Hesperomys*). The new generic term *Phenacomys* is proposed for a group of Arvicolines, distinguished by their rooted teeth, and apparently closely connecting the Cricetines with the Arvicolines. A number of skulls are figured. (See *Emballonuride*, *Sciuride*, *Muride*, and *Leporide*.)

MIDDENDORF, A. [See *Bovide*.]

MILNE-EDWARDS, A., & OUSTALET, E. Études sur Les Mammifères et les Oiseaux des Iles Comores. N. Arch. Mus. (2) x, pp. 219-297 (1888).

MINOT, C. S. Segmentation of the Ovum, with especial reference to the *Mammalia*. Am Nat. xxiii, pp. 460-481 & 753-769.

The homology of the Mammalian blastodermic vesicle is fully discussed in the second portion of this memoir.

——. Uterus and Embryo. I. Rabbit; II. Man. J. Morph. iii, pp. 341-462, pls. xxvi-xxix.

An elaborate paper, illustrated by histological plates. The author gives a long summary of his conclusions, and also a very full bibliography.

MODIGLIANI, E. Appunti intorno ai Mammiferi dell' Isola Nias. Ann. Mus. Genov. (2) vii, pp. 238-245.

Notes on the Mammals of the island of Pulo Nias, Malay Archipelago, which include 1 *Macacus*, 1 *Felis*, 1 *Tupaia*, 9 Bats, 2 Rodents, 1 *Sus*, and 1 *Manis*.

MÜLLER, J. [See *Simiide*.]

MOJSISOVICS, A. VON. [See *Cerride*.]

MONTICELLI, F. S. [See *Chiroptera*.]

MORAU, H. [See *Rodentia*.]

MORENO, F. P. Breve Reséna de los Progresos del Museo la Plata durante el Segundo Semestre de 1888. Bol. Mus. la Plata, 1889, pp. 1-44.

In the course of this progress-report, notes are given on some of the Tertiary Mammals of the Argentine, with descriptions of new genera and species. [See *Toxodontide* and *Dasypodide*.]

MOURLON, M. Sur la découverte a Ixelles (lez-Bruxelles) d'un Ossuaire de Mammifères, antérieur au Diluvium. Bull. Ac. Belg. (3) xvii, pp. 131-151.

Records remains of various Mammals, mostly of existing species, and describes and figures a molar of *Equus*, as *E. intermedium* (p. 144, woodcut), n. sp. [See *Equide*.]

MOUSSU, G. De l'Innervation des Glandes Molaires Inférieures, Nerfs Excito-Sécrétoires. C.R. Soc. Biol. (9) i, pp. 395-398.

Describes the excitor nerves of the sub-maxillary glands, and concludes that those supplying the parotid are derived from the motor branch of the trigeminal, and not from the facial.

— Les Nerfs Excito-Sécrétoires de la Parotide chez le Cheval, le Mouton, et le Porc. T. c. pp. 343-345.

Describes the distribution of the nerves supplying the parotid gland in the Horse, Sheep, and Pig.

NAUMANN, E. [See *Elephantidæ*.]

NEHRING, A. Diluviale Wirbelthiere von Posneck in Thüringen. JB. Mineral. 1889, i, pp. 205-214.

Records the following species from the Pleistocene of Thuringia, viz., *Spermophilus altaicus*, *Alactaga jaculus*, *Lagomys pusillus*, *Arvicola amphibius*, *A. aecomus*, ? *A. arvalis* and *Canis* (? *vulpes*).

— Ueber Säugethiere von Wladiwostock in Südost-Siberia. SB. nat. Fr. 1889, pp. 141-144.

A notice of a collection of Mammals from Wladiwostock, which includes *Sus*, *Nemorhædus*, *Felis* (? *microtis*), *F. tigris*, and a species of *Ursus*. [See *Suidæ*.]

— [See also *Canidæ*, *Sciuridæ*, *Caviidæ*, and *Cervidæ*.]

NERVANI, A. [See *Delphinidæ*.]

NEWTON, E. T. Some Additions to the Vertebrate Fauna of the Norfolk Preglacial Forest-Bed. Geol. Mag. (3) vi, pp. 145-149, pl. v.

Describes (with figures) remains referred to *Cercus rectus* (n. sp.), *Bison bonasus*, *Phoca barbata*, *Delphinapterus leucas*, and *Phocæna communis*. [See *Cervidæ*.]

NICHOLSON, H. H., & LYDEKKER, R. Manual of Palæontology. 3rd ed. 2 vols., illustrated. Edinburgh: 8vo.

Pp. 1245-1474 are devoted to the *Mammalia*. [See *Cotylopidæ* and *Megatheriidæ*.]

NOACK, P. Beiträge zur Kenntniss der Säugethier-fauna von Süd- und Südwest Africa. Zool. Jahrb.-Abth. f. Syst. iv, pp. 94-261, pls. i-v.

Description of the Mammals from southern and south-western Africa collected by Hans Schinz & P. Hesse, of which the former are preserved at Riesbach, near Zürich, and the latter in the Senckenbergian Museum at Frankfurt. The list includes 77 species, and comprises the following new forms, viz., *Manis hessi* (p. 100, pl. i), *Gerbillus tenuis*, var. *schinzi* (p. 134, pl. iii, figs. 13-16), *Mus* (*Micromys*) *microdontoides* (p. 141, pl. ii, fig. 4), *Macroscelides brachyrhynchus*, var. *schinzi* (p. 198), *Vesperugo* (*Vesperus*) *damarensis* (p. 213, pl. v, fig. 59), *V. pusillus* (p. 216, pl. 2, fig. 2), *V. pagenstecheri* (p. 220, pl. ii, fig. 3), *Chalinolobus congicus* (p. 223, pl. ii, fig. 1). Figures are given of *Manis hessi*, *Chalinolobus congicus*, *Vesperugo pusillus*, *V. pagenstecheri*, *Mus microdontoides*, and *Crocidura doriani*; while the other illustrations are devoted to skulls. [See *Macroscelididæ*, *Vespertilionidæ*, *Muridæ*, and *Manidæ*.]

OSBORN, H. F. [See SCOTT, W. B.]

OVIATT, B. L. Cardiac Muscle-Cells in Man and certain other Mammals. P. Am. Micr. Soc. ix, pp. 283-298, woodcuts (1888).

After a short sketch of previous work, the author describes and figures the cardiac muscle-cells of several Mammals.

PEARSON, L. The Muscular Coats of the (Esophagus of the Domesticated Animals. *Op. cit.* x, pp. 128-139.

Describes these structures in several domesticated Mammals, with directions for making microscopic preparations of the same.

POUCHET, G., & BEAUREGARD, H. [See *Physeteridæ*.]

RADDE, G., & WALTER, A. Die Säugethiere Transcaspiens. Zool. Jahrb.-Abth. f. Syst. iv, pp. 993-1094, pl. xxviii.

A description of the Mammals of Transcaspia, with notes by W. Blasius. 60 wild species are recorded, of which 1 *Nesokia* is described as new. [See *Muridæ*.]

REUVENS, C. L. [See *Primates*.]

RODLER, A. [See *Giraffidæ*.]

ROETTER, F. [See *Muridæ*.]

RÖSE, C. Zur Entwicklungsgeschichte des Säugethierherzens. Morph. JB. xv, pp. 436-456, pl. xvi.

An elaborate paper on the developmental history of the Mammalian heart.

RÜDINGER, N. [See *Primates*.]

RÜTIMEYER, L. [See *Artiodactyla*.]

SCHÄFF, E. [See *Canidæ* and *Ursidæ*.]

SCHWALBE, G. [See *Hominidæ*.]

SCLATER, P. L. [See *Boridæ*.]

SCLATER, W. L. On a Collection of Mammals procured at Shahpur, Punjab, &c. P. A. S. B. 1889, p. 144.

The species recorded are *Canis (Vulpes) bengalensis*, *Herpentes auro-punctatus*, *Erinaceus collaris*, *Scotophilus pallidus*, and *Mus bactrianus*.

— [See also *Cervidæ*.]

SCOTT, J. H., & PARKER, T. J. [See *Physeteridæ*.]

SCOTT, W. B. [See *Carnivora*.]

— & OSBORN, H. F. The *Mammalia* of the Uinta Formation. Tr. Am. Phil. Soc. xvi, pp. 461-572, pla. vii-xi.

This important memoir is divided into four sections, of which the two first are by W. B. SCOTT and the others by H. F. OSBORN. The first section is devoted to the geological and faunal relations of the Uinta group. The second treats of the Creodonts, Rodents, and Artiodactyles. Among the Creodonts, *Mesonyx* and *Miacis* are described; the latter, in opposition to the view of Schlosser, is retained in the *Creodonta*, although

its close similarity in dental characters to the *Carnivora Vera* is indicated. In the Rodents, *Plesiarctomys* is fully described, and is regarded as a very generalized type. Thus it has tritubercular molars; and in the large size of the preorbital vacuity and the absence of postorbital processes it differs from existing *Sciurida*, and resembles the *Hystriomorphia*. Among the *Artiodactyla*, *Leptotragulus* is shewn to be a Cameloid, and probably the ancestor of *Pæbrotherium*. It is incidentally shown that *Homacodon* is allied to, and not improbably identical with *Dichobunus*; and it is suggested that the *Tylopoda* may have been descended from the latter. The genus *Protoreodon* is fully described, and is shown to have all the characters of the *Cotylopidæ* (*Oreodontidæ*), although with five cusps on the molars. *Cotylops* (*Oreodon*) is shown to have a distinct pollex. *Helohyus* may be an ancestral form of *Protoreodon*, in which event the *Cotylopidæ* will be allied to the *Anthrotheriidae* rather than the *Camelidae*. In the third part it is stated that *Dilophodon* and *Densatotherium* are synonyms of *Helaletes*. *Colonoceros* is stated to be indistinguishable by dental characters from *Hyrachyus*; while *Limnohyus* is said to be a synonym of *Palaosyops*. *Eohippus* is identified with *Hyracotherium*, but *Orohippus*—on account of the fourth lower premolar being as complex as the first molar—is regarded as distinct, and considered to be the same as the European *Pachynolophus*. The author then proceeds to describe the characters of the genera *Melamynodon* and *Amynodon*, which are regarded as referable to a distinct family—*Amynodontidae*; one new species of *Amynodon* being described. We next have a description of *Diplacodon*, which is shown to be intermediate, both in structure and size, between the Eocene *Palaosyops* and the Miocene *Titanotherium*. This is followed by a full diagnosis of *Isotolophus*, which is regarded as allied to the Tapirs. *Triplopus* is shown to be identical with the later *Prothyrocodon*; and this part concludes with a description of *Ephippus*, which is shown to be allied in many respects to *Hyracotherium*, although with a more complex fourth upper premolar. The fourth, and final, part is devoted to general considerations on the evolution of the feet of the more specialized *Ungulata*. [See *Rhinocerotidae* and *Lambdotheriidae*.]

SHUFFELDT, R. W. Remarks upon Extinct Mammals.

A series of papers from the "American Field," xxxii, reprinted in 8vo form, illustrated; being a popular account of some of the extinct Mammalian types of North America.

— [See also *Muridae*.]

SIMROTH, . . . Verwilderte Haustiere auf S. Thomé. Zool. Gart. xix, pp. 15 & 16.

Notices the various Mammals, such as Goats, Rabbits, Cats, Rats, and Mice, which have become feral in this island.

STEINMANN, G., & DÖDERLEIN, L. Elemente der Palæontologie. Strasburg: 8vo, 829 pp., illustrated.

Pp. 678–829 are devoted to the *Mammalia*.

STOWELL, T. B. [See *Felidae*.]

STRAHL, H. Zur vergleichenden Anatomie der Placenta. Verh. Anat. Ges. Berl. 1889, pp. 15 & 16.

A short note on the anatomy of the placenta.

— [See also *Mustelidæ*.]

STRUTHERS, J. [See *Balanidæ*.]

STUDER, P. (1) Ueber Säugethierreste aus glacialen Ablagerungen des böhmischen Mittellandes. (2) Ueber die *Arctomys*-Reste aus dem Diluvium der Umgegend von Bern. Separately printed from MT. Ges. Bern. Bern: 1888, 17 pp. [Omitted from Zool. Rec. xxv.]

Records remains of *Arctomys marmotta*, *Meles taxus*, *Elephas* sp., *Equus caballus*, *Rhinoceros antiquitatis*, and *Rangifer tarandus*, from the deposits mentioned.

SYMINGTON, J. [See *Simiidæ*.]

TELLER, T. [See *Tapiridæ*.]

THOMAS, O. In AITCHISON'S Zoology of the Afghan Delimitation Commission—Mammals. Tr. L. S. (2) Zool. v, pp. 55–65.

Specimens belonging to 13 species are recorded, while some other species are mentioned of which no examples were received. *Ellobius intermedius*, Scully, is considered inseparable from *E. fuscicapillus*, Blyth.

— On the Mammals of Mount Kina Balu, North Borneo. P. Z. S. 1889, pp. 228–236, pl. xxiv.

Based on specimens collected in 1887–88, by Mr. J. Whitehead, preliminary notices of the new forms having been already given by the writer. The list includes *Semnopithecus hosei* (*infra*, p. 20), *Cynopterus ecaudatus*, *Tupaia ferruginea*, *Hylomys suillus*, *Chimarrogale himalayica*, *Crociodura* sp., *Pteromys nitidus*, *Sciurus bicolor*, *S. przewalski*, *S. jentinki*, *S. notatus*, *S. whiteheadi*, *Mus infraluteus*, *M. rattus*, *M. sabanus*, *M. lepturus*, *M. alticola*, *M. musschenbroeckii*, *M. ephippium*, *Chiropodomys glicoides*, and *Trichys guentheri* (n. n., *infra*, p. 33). The plate figures *Sciurus whiteheadi*.

— [See also *Viverridæ*, *Mustelidæ*, *Vespertilionidæ*, *Phyllostomatidæ*, *Muridæ*, *Hystericidæ*, *Cervidæ*, and *Ornithorhynchidæ*.]

TRUE, F. W. On the Mammals collected in Eastern Honduras, in 1887, by C. S. Townsend, with a Description of a new Subspecies of *Capromys*. P. U. S. Nat. Mus. x, pp. 469–472 (1888).

In addition to the new variety of *Capromys*, records 13 species of Mammals. [See *Octodontidæ*.]

— [See also *Cervidæ* and *Delphinidæ*.]

TRUTAT, E. [See *Talpidae*.]

TUCKERMANN, F. [See *Sciuridæ*.]

TURNER, W. [SIR]. [See *Sirenia* and *Cetacea*.]

VAN BENEDEN, P. J. [See *Cetacea*.]

VIRCHOW, R. [See *Felidae*.]

WALDEYER, H. [See *Simiidæ* and *Cercopithecidæ*.]

WALKER, M. J. [See *Monotremata*.]

WEITHOFER, K. A. Ueber die tertiären Landsäugethiere Italiens. *JB. geol. Reichsanst.* xxxix, pp. 55-89.

A general review of the fossil Mammals hitherto described from Italy. A description is given of *Lutra campanii*, Meneghini, which is referred to *Enhydriodon*; and a discussion follows on the affinities of the various species of *Hyænartus*. A list is given of the fauna of the Val d'Arno beds, in which a new species of *Elephas* and another of *Lepus* are introduced. There is a long discussion on the dental characters of the different species of *Rhinoceros* from these beds. In treating of the Ruminants, *Paleoreas montis-caroli* is regarded as closely allied to *Tragelaphus*; while the new name *Helicophora* is proposed to replace *Helicoceras* [*Zool. Rec.* xxv, *Mamm.* p. 51], which is preoccupied, this genus being from the Pikermi beds of Greece. [See *Leporidae*, *Elephantidae*, and *Boridae*.]

— [See also *Hyenidae* and *Tapiridae*.]

WESTLING, C. [See *Echidnidae*.]

WILCKENS, M. [See *Equidae*.]

WILLOUGHBY, J. C. [SIR]. East Africa and its Big Game. London: 1889, 8vo, 312 pp., illustrated.

A popular account is given of many of the larger African Mammals, with figures of the heads of many species.

WINDLE, B. C. A. A Note on the Musculus Sternalis. *Anat. Anz.* iv. pp. 715-718.

Notes the occurrence of this muscle in a number of foetuses, both normal and malformed.

— The Flexors of the Digits of the Hand. 1. The Muscular Masses of the Fore-Arm. *J. Anat. Phys.* xxiv, pp. 72-84.

Treats of the arrangement of the flexor sublimis and profundus digitorum and flexor longus pollicis. The first section discusses the factors of the flexor digitorum mass; in the second section these muscles are described in Mammals other than Man; while the third section is devoted to those of Man. The paper concludes with a tabulated list of these muscles in 56 Mammals.

— The Pectoral Group of Muscles. *Tr. R. Irish Ac.* xxix, pp. 34-378. [See *Zool. Rec.* xxv, *Mamm.* p. 22.]

This elaborate paper, treating of the origin and homologies of the muscles in question as exemplified in the *Mammalia*, is divided into three sections. The general results arrived at are given in the first section; the second contains a detailed account of each of the factors of the group; and the third, of their arrangement and peculiarities in the various Mammalian families. In conclusion, there is a table exhibiting the arrangement of these muscles in all the Mammals referred to in the text.

ZANDER, R. Ueber die sensibeln Nerven auf Rückenfläche der Hand bei Säugethieren und beim Menschen. *Anat. Anz.* iv, pp. 751-759 & 775-785.

A comparison of the nerves of the back of the hand of Man with those of other Mammals.

ZIGNO, A. [See *Anthracotheriidae*.]

II.—FAUNAS.

A.—RECENT.

British Isles. See BROWNE, p. 5 (Leicestershire); and BROWN & BUCKLEY, p. 5 (Hebrides).

Continent. See BIELZ, p. 4 (Germany); LOCARD, p. 10 (Rhône valley); DALLA-TORRE, p. 7 (Heligoland).

Central Asia. See BÜCHNER, p. 30; THOMAS, p. 15; RADDE & WALTER, p. 13 (Transcaspia).

Siberia. See NEHRING, p. 12.

India, &c. See W. L. SCLATER, p. 13 (Punjab); ANDERSON, p. 3 (Mergui Archipelago); MODIGLIANI, p. 11 (Pulo-Nias, Malayana); THOMAS, p. 15 (Borneo); EVERETT, p. 7 (Palawan).

Africa. See BOCAGE, p. 4 (Angola and Congo); WILLOUGHBY, p. 16 (East Africa); NOACK, p. 12 (S. and W. Africa); BOCAGE, p. 4 (St. Thomas).

North America. See MERRIAM, p. 11.

Honduras. See TRUE, p. 15.

South America. See ALLEN, p. 2 (Mexico); COPE, p. 5 (Brazil).

B.—FOSSIL.

England. See NEWTON, p. 12.

Continent. See NEHRING, p. 12 (Thuringia); STUDER, p. 15 (Germany); WEITHOFER, p. 16 (Italy).

North America. See COPE, p. 6 (Canada); MARSH, p. 10; SCOTT & OSBORN, p. 13.

Central and South America. See AMEGHINO, p. 2; BURMEISTER, p. 5; LEIDY, pp. 9 & 10 (Florida and Louisiana); MORENO, p. 11.

III.—SPECIAL STRUCTURES, DEVELOPMENT, &c.

ABNORMALITIES.

Costal.—See CUNNINGHAM, *Hominidae*.

Muscular.—See WINDLE, p. 16.

Epiglottis.—See HOWES, p. 8.

Foot.—See AULD, *Ungulata*; MOJSISOVIC, *Equidae*.

DENTITION.—See HUMPHREYS, p. 9; KLEVER, *Equidae*; LATASTE, p. 9; ROETTER, *Muridae*; THOMAS, *Ornithorhynchidae*.

DEVELOPMENT & EMBRYOLOGY.—See BENDA, p. 4 (testicle); BONNET, *Equidae* (egg-membranes); BORN, p. 4 (heart); DUVAL, *Rodentia* (placenta); FLEISCHMANN, *Carnivora* (placenta); FROMMEL, p. 7, and

Chiroptera (placenta); HEINRICIUS, *Canidæ* (placenta); HUBRECHT, p. 8 (placenta); MARIUS, *Leporidae* (placenta); MINOT, p. 11 (segmentation of ovum; uterus and embryo); RÖSE, p. 13 (heart); STRAHL, p. 15, and *Mustelidae* (placenta); WALDEYER, *Cercopithecidae* (placenta).

DIGESTIVE SYSTEM.—PEARSON, p. 13 (œsophageal muscles); TUCKERMANN, *Sciuridae* and *Peramelidae* (gustatory organs).

EYE.—See KOHL, *Talpidae*.

MORPHOLOGY.—See BARDELEBEN, p. 3 (prepollex); BAUR, p. 4 (carpus); DOLLO, p. 7 (proatlas); HATSCHKE, p. 8 (limbs); HERBURN, p. 8 (joints); JELGERSMA, p. 9 (brain); STRAHL, p. 15 (placenta).

MUSCLES.—See GAGE, p. 7 (fibres of); GRUBER, p. 8 (foot); OVIATT, p. 13 (cardiac); PEARSON, p. 13 (œsophageal); WINDLE, p. 16; STOWELL, *Feliidae* (soft palate).

NERVES, BRAIN, &c.—See BAGINSKY, p. 3 (auditory); GIACOMINI, *Simiidae* (brain of chimpanzee); JELGERSMA, p. 9 (brain); KÜKENTHAL, *Cetacea* (brain); LENHOSSÉK, p. 10 (spinal cord), *Muridae* (development of neural sheath); MÖLLER, *Simiidae* (chiasma of chimpanzee); MOURSET, p. 12 (facial); ZANDER, p. 17 (hand).

OSTEOLOGY.—See BAUR, *Proboscidea* (carpus); DOLLO, p. 7 (proatlas); LAVOCAT, p. 9 (ribs and sternum); MEHNERT, p. 10 (pelvis); SYMINGTON, *Simiidae* (vertebrae of gorilla). See also CUNNINGHAM, *Primates*.

URINOGENITAL ORGANS.—See BENDA, p. 4 (development of testicle); CZERNY, p. 7 (Wolfian bodies); HERMANN, *Muridae* (spermatoblasts).

VASCULAR SYSTEM.—See BORN, p. 4 (development of heart); DETMERS, p. 7 (blood-corpuscles); KULCZYCKI, *Canidae* (arteries); OVIATT, p. 13 (cardiac muscles); RÖSE, p. 13 (development of heart).

IV.—SPECIAL WORK.

(*Extinct species and genera are indicated by a †.*)

1.—PRIMATES.

ANTHROPOIDEA.

CUNNINGHAM, J. The Proportion of Bone and Cartilage in the Lumbar Section of the Vertebral Column of the Ape and several Races of Man. *J. Anat. Phys.* xxiv, pp. 117–126.

These observations relate to the author's investigations of the form of the lumbar curve in Man and Apes.

REUVENS, C. L. Die Affen in Zoologischen Garten zu Rotterdam. *Zool. Gart.* xxx, pp. 182–187 & 206–213.

An account of the specimens of *Primates* living in the Zoological Gardens at Rotterdam.

RÜDIGER, N. Demonstrative Betrachtung der Wirbelsäule von niederen Affen, dem Gorilla und dem Menschen. *SB. Ges. Morph.* iv, p. 107. Title and discussion only.

a. HOMINIDÆ.

CUNNINGHAM, J. The occasional Eighth True Rib in Man, and its relation to Right Handedness. J. Anat. Phys. xxiv, pp. 127-129.

The occurrence of an eighth rib is recorded in 14 instances out of 70 subjects examined.

— The Spinal Curvature in an Aboriginal Australian. P. R. Soc. xlv, pp. 487-504, woodcuts.

It is shown that the curves of the spine of the female Australian are in several respects intermediate between those found in the European and the Chimpanzee, these intermediate features being more especially shown in the lumbo-sacral region.

SCHWALBE, G. Das Darwin'sche Spitzohr beim Menschlichen Embryo. Anat. Anz. iv, pp. 176-189, woodcuts.

Describes the condition in the fetus of the cartilaginous process in the helix of the human ear, first brought to notice by Darwin, and points out its relation to the ears of the Apes.

b. SIMIIDÆ.

GIACOMINI, C. Sul Cervello di un Chimpanse. Atti Acc. Tor. xxiv, pp. 798-817, pl. xvi.

A detailed description of the brain of the Chimpanzee.

MÖLLER, J. Ein interessantes Befund am Chiasma n. o. des Chimpanse. Anat. Anz. iv, pp. 539-545, woodcuts.

Describes a peculiarity in the optic chiasma of the Chimpanzee.

— Ueber eine Eigenthümlichkeit der Nervenzellenfortsätze in der Grosshirnrinde des Chimpanse, als Unterschied gegen den Menschen. T. c. pp. 592-596, woodcuts.

Describes a peculiarity in the cortical part of the brain of the Chimpanzee which does not occur in Man.

SYMINGTON, J. The Vertebral Column of a Young Gorilla. J. Anat. Phys. xxiv, pp. 42-51, pl. iv.

Describes and figures a section of the vertebral column of a young Gorilla, which shows that the lumbar curvature is more developed than in the Chimpanzee, and that both in the Gorilla and Chimpanzee this curvature is developed at an earlier period than in Man.

WALDEYER, H. Das Gorilla-Rückenmark. Abh. Ak. Berl. 1888, Art. 3, pp. 1-147, pls. x-xxi.

The full text of an elaborate memoir on the spinal cord of the Gorilla, of which abstracts have been already published.

c. CERCOPITHECIDÆ.

DEPÉRET, C. Sur le *Dolichopithecus rusciniensis*, nouveau Singe fossile du Pliocène du Roussillon. C.R. cix, pp. 982 & 983.

Describes remains of an Ape from the Pliocene of Perpignan, said to be allied to the Pikermi *Menopithecus*, but of larger size, with a longer face,

and a larger hind talon to the last lower molar. It resembles that genus in having the short limbs of *Macacus*, and the skull and teeth of *Semnopithecus*. A. GAUDRY has a note on the specimens on p. 955 of the volume cited.

JENTINK, F. A. Some Observations relating to Two *Semnopithecus*-Species from the Malayan Archipelago. Notes Leyd. Mus xi, pp. 215-218, pl. ix, figs. 5-7.

Discusses the synonymy and character of *Semnopithecus femoralis* and *S. maurus*; and concludes that *S. precinosus* (skull figured) is a synonym of the latter.

WALDEYER, W. Die Placenta von *Inuus nemestrinus*. SB. Ak. Berlin. 1889, pp. 697-710, woodcut.

In describing the placenta of this species of *Macacus*, the author shows that the chorion is double, as Heinricius has proved to be the case in the Dog (see p. 23).

†*Dolichopithecus rusciniensis*, n. g. & sp., C. DEPÉRET, *op. cit.*, Pliocene, Perpignan, France.

Semnopithecus hosei, n. sp., O. THOMAS, P. Z. S. 1889, pp. 159 & 160. N.W. Borneo.

2. CARNIVORA.

FLEISCHMANN, A. Ueber Entwicklung der Placenta bei Raubthieren. Tag. Deut. Nat. Vers. 1889, p. 46 (Abstract).

Summarizes the author's conclusions as to the structural peculiarities of the placenta of the *Carnivora*.

——. Ueber den Tragsack der Raubthiere. SB. Soc. Erlangen, 1888, p. 36. Title only.

SCOTT, W. B. Notes on the Osteology and Systematic Position of *Dinictis felina*, Leidy. P. Am. Phil. Soc. 1889, pp. 211-244, woodcuts.

The first part of this memoir is devoted to the description of the skeleton, accompanied by figures of the skull and some of the limb-bones. In the second part there is a discussion as to the systematic position of the genus, and the affinities of the different families of the *Fissipede Carnivora*. It is considered that Schlosser is correct in regarding the division into *Eluroidea*, *Cynoidea*, and *Arctoidea*, as not supported by palæontology. The conclusions that have been previously published as to the close alliance between Dogs and Bears are regarded as well founded; and it is also concluded, in opposition to the views of Schlosser, that there is an equally near relationship between Viverrines and Dogs. The derivation of the *Felidae* is then discussed, and Schlosser's conclusion that this family has been derived directly from the *Creodonts* is held to be untenable, and the more general view of their close relationship to the *Viverroids* is upheld. *Dinictis* is regarded as being in several respects intermediate between the modern *Felines* and *Viverroids*; and the author concludes that this genus should be placed in Cope's family

of the *Nimravidae*, his previously published opinion that *Cryptoprocta* and *Dinictis* should be classed together in the separate family of the *Cryptoproctidae* being withdrawn. The alleged relationship of the *Mustelidae* to the *Viverridae* is also discussed; and it is concluded that *Stenoplesictis* shows signs of a transition from the Viverroid to the Musteloid type; from which it is inferred that the Mustelines and Bears have lost the septum of the auditory bulla independently of one another, and that they have no real affinity. In the course of the paper it is concluded that the name *Daphenus* should be retained for the American forms described as *Amphicyon*.

I. PINNIPEDIA.

For an account of the foot-structure by H. LEBOUCC, see *Cetacea*.

a. PHOCIDÆ.

Phoca annellata: note on a female in the Zoological Gardens at Berlin, by E. SCHÄFF, Zool. Gart. xxx, pp. 339 & 340.

II. CARNIVORA VERA.

b. FELIDÆ.

STOWELL, T. B. The Muscles of the Soft-Palate in the Domestic Cat. P. Am. Ass. 1888, p. 287 (Abstract), and P. Am. Micr. Soc. x, pp. 58-76, woodcut.

The whole of the muscular, neural, and vascular structures connected with this region are described.

VIRCHOW, R. Ueber altägyptische Hauskatzen. Verh. anthrop. Ges. [= Zeitschr. f. Ethnol.], xxi, pp. 458-463 & 552-572, pl. ii, and woodcut.

Describes and figures mummified specimen of *Felis caffra* (= *maniculata*) from Bubastis and Beni-Hassan, Egypt. These are regarded as merely tamed wild cats, having no relation with the domestic cat, the origin of which should probably be sought in Europe or Asia. In a discussion on the paper, H. Nehring thought that some of the specimens should be referred to *F. caligata* (regarded by many writers as identical with *F. caffra*); and from the black sole of the hind foot in these Egyptian cats and in the domestic cat of Europe considered that the latter is descended from the former, with perhaps some intermixture from an Asiatic stock. The domestic cat of China is regarded as of purely Asiatic origin.

†*Macharodus floridanus*, n. sp., J. LEIDY, Tr. Wagner Inst. ii, p. 14, pl. iii, fig. 1. [See also P. Ac. Philad. 1889, pp. 29 & 30.]

Felis tigris: a notice by C. T. BUCKLAND in the Field, recording a black individual found dead at Chittagong in 1846, is reprinted in J. Bomb. N. H. Soc. iv, pp. 149 & 150.

Felis manul and *F. chaus* recorded from the Pleistocene of Europe by A. NEHRING, SB. nat. Fr. 1889, pp. 109-111.

Felis braccata, n. sp., E. D. COPE, Am. Nat. xxiii, p. 144, S. Brazil.

Felis domestica: notes on its habits by F. HELM, Zool. Gart. xix, pp. 197-200.

+*Felis platensis*, n. sp., F. AMEGHINO, t. c. (*suprà*, p. 2), p. 329, woodcut, Tertiary, Argentine.

c. HYÆNIDÆ.

WEITHOFER, K. A. Die fossilen Hyänen des Arnothales in Toskana. Denk. Ak. Wien, lv, pp. 337-360, pls. i-iv.

The complete memoir, of which an abstract was published in 1888 [Zool. Rec. xxv, *Mamm.* p. 30]. The author commences with a review of the previous literature of the European Pliocene forms. He concludes that *Hyæna arvernensis* is more nearly allied to *H. brunnea* than to *H. striata*, which it exceeds in size, and doubts the evidence of the occurrence of the latter in the Val d'Arno. The species described from the Val d'Arno comprise *H. topariensis* and *H. robusta* from the Pliocene, and *H. crocuta* in the Pleistocene. *H. topariensis*, Major, is regarded as closely allied to the French *H. perrieri*, and is considered to have affinity both with *H. crocuta* and *H. striata*; the lower carnassial having no inner cusp, and the upper true molar being comparatively large. *H. robusta* is described as being allied to the Siwalik *H. felina*, but always retaining the first upper premolar. Figures of the dentition and parts of the crania and jaws are given of both the Pliocene species: *H. crocuta* being represented by a mandible which is also figured.

d. VIVERRIDÆ.

FILHOL, H. Description d'une Tête du *Palæopriodon lamandini*. Bull. Soc. Philom. (8) i, pp. 115-118.

Shows that in the general characters of the basis cranii, and especially in the presence of an alisphenoid canal, this species resembles the *Viverride*; but in having a glenoid foramen, and in the position of the condylar foramen, it resembles the *Mustelidæ*, with which it also agrees in its dental formula.

— Note sur la Disposition des Orifices de la Base du Crane de la *Viverra antiqua*. T. c. pp. 109 & 110, woodcut.

Shows that this species agrees very closely with the existing species of *Viverra*, having an alisphenoid canal.

THOMAS, O. On a new Mongoose allied to *Herpestes albicaudatus*. P. Z. S. 1889, pp. 622-624, pl. lxii.

Describes the imperfect skeleton of a large Mongoose from Africa, under the name of *H. grandis*.

Herpestes grandis, n. sp., O. THOMAS, t. c. p. 622, Africa.

e. CANIDÆ.

BOULE, M. Le *Canis megamastoides* du Pliocene moyen de Perrier. Bull. Soc. géol. (3) xiv, pp. 321-330, pl. viii.

Describes and figures the type skull of this species. Concludes that it was allied to the Foxes and Jackals, but with marked affinity to *Cynodictis*; and suggests that while the Foxes and Viverroids are derived from the latter, the Wolves and Bears are descended from *Amphicyon*. This dual origin is not held to justify the separation of the Foxes from *Canis* as *Vulpes*.

— Les Prédecesseurs de Nos Canides. C.R. cviii, pp. 201-203.

This paper is partly based on the results reached by the examination of the subject of the preceding one. *Canis megamastoides* (*borbonicus*) is considered to connect the Foxes and Jackals with *Cynodictis*; *C. nescherensis* is very close to the Jackals; *C. etruscus* is allied to the Wolves; *C. arus* is of the *Cyon* type; while a Pliocene jaw has all the characters of the Dogs, which are concluded to have been derived from Wolves and Jackals.

HEINRICIUS, G. Die Entwicklung der Hunde-Placenta. SB. Ak. Berlin, 1889, pp. 111-117, woodcut.

— Ueber die Entwicklung und Structur der Placenta beim Hunde. Arch. mikr. Anat. xxxiii, pp. 419-439, pls. xxvi & xxvii.

These two papers give a full account of the development of the placenta of the Dog, as compared with other Mammals. The presence of a double chorion is shown.

FILHOL, H. Sur la Présence d'Ossements de *Cuon* dans les Cavernes des Pyrénées Ariégeoises. Bull. Soc. Philom. (8) i, pp. 31-33, woodcut.

Describes and figures a mandibular ramus from a cavern in Ariège, under the name of *Cyon europæus*, var. *pyrenaicus*.

KULCZYCKI, W. Die Hautarterien des Hundes. Anat. Anz. iv, pp. 276-282.

Describes the origin and distribution of the dermal arteries in the Dog.

Canis adustus, Sundevall; E. SCHÄFF, SB. Ges. Nat. 1889, pp. 198 & 199, shows that *C. lateralis*, Sclater, is identical with this species; the lateral stripe only occurring in the summer coat.

Canis karagan and *C. corsac* recorded from the Pleistocene of Europe by A. NEHRING, SB. nat. Fr. 1889, pp. 109-111.

Canis dingo: a popular account by R. LENDENFELD, Zool. Gart. xxx, pp. 43-49, with figure.

†*Canis lydekkeri*, n. sp., F. AMEGHINO, t. c. (*suprà*, p. 2), p. 305, Pleistocene, Brazil.

†*Cyon europæus*, n. var. *pyrenaicus*; H. FILHOL, Bull. Soc. Philom. (8) i, pp. 31-33, woodcut.

f. *URSIDÆ.*

SCHÄFF, E. Ueber den Schädel von *Ursus arctus*, L. Arch. f. Nat. 1889, i, pp. 244-267, pla. xiii & xiv. [Abstract in SB. nat. Fr. 1889, pp. 94-96.]

Describes and figures skulls and teeth of several Russian examples of *Ursus arctus* to show individual variation; and also gives tables of measurements. Concludes that *Myrmarcus evermanni*, Gray, is only a variety of *U. arctus*, quoting the earlier observations of the recorder as to this being probably the case. Suggests that *U. piscator*, *U. isabellinus*, *U. syriacus*, and other so-called species are likewise only varieties of the same. [*U. isabellinus* has been identified with *U. arctus*, by W. T. Blanford.]

g. *MUSTELIDÆ.*

FILHOL, H. Note sur les Caractères de la Base du Crane des *Plesictia*. Bull. Soc. Philom. (8) i, pp. 106-108, woodcut.

Shows that the general characters of the basis cranii of *Plesictia* are Musteline; but that in the inflated bulla and the form of the upper molar it approximates to the *Viverridæ*.

— Observations concernant le Cerveau du *Potamotherium valetoni*. T. c. pp. 17-21, woodcuts.

After noticing the approximation to a Viverroid type in the dentition, as shown by the presence of a second upper molar, and in the form of the upper and lower carnassials and first upper molar, the author proceeds to show that the characters of the brain are essentially those of the *Viverridæ*, and not of the existing Otters and other Mustelines.

STRAHL, H. Ueber die Placenta von *Futorius furo*. Anat. Anz. iv, pp. 375-377, woodcut.

Describes and figures the placenta of the Ferret.

THOMAS, O. Preliminary Notes on the Characters and Synonymy of the different Species of Otter. P. Z. S. 1889, pp. 190-200.

In this communication the intricate synonymy of this group is cleared up so far as the available materials admit. It is concluded that all the existing Lutrines should be referred to *Lutra* and *Enhydria*. The species of *Lutra* are then discussed from a distributional point of view. The Oriental species are considered to be four, for which the names *L. vulgaris*, *L. barang*, *L. sumatrana*, and *L. cinerea*, are adopted; the latter name being for the species commonly known as *L. leptonyx*. The Ethiopian species include *L. capensis* and *L. maculicollis*. Difficulty is experienced in regard to the American forms, and the full consideration of this group is postponed.

†*Mephitis cordubensis*, n. sp., F. AMEGHINO, t. c. (*suprà*. p. 2), p. 323, pl. f, fig. 20, Tertiary. Argentine.

Lutra vulgaris : notes by B. LANGKAVEL, Zool. Gart. xxx, pp. 201-206.
E. SCHÄFF, SB. nat. Fr. 1889, pp. 114-116, describes the variations in the size of the skull.

III. CREODONTA.

†*Acyon hardus*, n. sp., F. AMEGHINO, t. c. (*suprà*, p. 2), p. 292, pl. i, fig. 18, Tertiary, Argentine.

†*Notictis ortizii*, n. g. & sp., F. AMEGHINO, t. c. p. 912, pl. lxxii, figs. 911 & 912, Tertiary, Argentine.

3. INSECTIVORA.

a. ERINACEIDÆ.

For placentation of *Erinaceus*, see HUBRECHT, *suprà*, p. 8.

b. MACROSCOLIDIDÆ.

Macroscelides brachyrhynchus, n. var. *schinzi*, P. NOACK, Zool. Jahrb. Abth. f. Syst. iv, p. 198, Ovamboland, S. Africa.

c. SORICIDÆ.

DOBSON, G. E. Description of a new species of Water-Shrew from Unalaska Island. Ann. N. H. (6) iv, pp. 370-372, woodcut.

Describes, with figure of dentition, a new species of *Sorex* from the Aleutian Islands (*infra*).

Crocidura anchietz, n. sp., J. V. B. DU BOCAGE, J. Sci. Lisb. (2) i, p. 26, Congo.

Crocidura nigricans, n. sp., DU BOCAGE, t. c. p. 28, Congo.

Crocidura bicolor, n. sp., DU BOCAGE, t. c. p. 29, Congo.

Crocidura (Pachyura) semmelinki, n. sp., F. A. JENTINK, Notes Leyd. Mus. xi, pp. 213 & 214, Banda-Neira.

Sorex hydrodromus, n. sp., G. A. DOBSON, Ann. N. H. (6) iv, pp. 370-372, woodcut, Unalaska I.

d. TALPIDÆ.

TRUTAT, E. Recherches pour servir à l'Histoire du Desman des Pyrénées. C.R. Soc. Biol. (9) i, pp. 286-288.

Gives a detailed description of the musk-glands, and also of the structure of the proboscis, of *Myogale pyrenaica*.

KOHL, C. Einige Notizen über das Auge von *Talpa europæa* und *Proteus anguineus*. Zool. Anz. xii, pp. 383-386 & 405-408.

The first part describes the rudimentary ophthalmic organs of the Mole.

Talpa europæa : C. I. TRUSTED has notes on its habits, P. Bristol. Soc. (2), vi, pp. 56-62.

4. *CHIROPTERA.*

ALLEN, H. On the Taxonomic Values of the Wing-Membranes, and of the Terminal Phalanges of the Digits in the *Chiroptera*. P. Ac. Philad. 1889, pp. 313-340, pl. x.

Considers that the features mentioned are of considerable importance in the determination of families and genera, and in some cases of species. Descriptions and illustrations of these features are given in a number of forms.

BOCAGE, J. V. BARBOZA DU. Chiroptères Africains, Nouveaux, Rares, ou Peu Connus. J. Sci. Lisb. (2) i, pp. 1-17, woodcuts.

Describes 3 species of *Epomophorus* (1 new), 1 of *Phyllorhina*, 1 of *Nycteris*, and 2 (new) of *Vesperugo* (*Vesperus*). [See *Pteropodidae* and *Vespertilionidae*.]

— Chiroptères de l'Île St. Thomé. T. c. pp. 197-199.

Describes two new Bats, from the Isle of St. Thomas, as *Cynonycteris brachycephala* and *Miniopterus newtoni*. [See *Pteropodidae* and *Vespertilionidae*.]

FROMMEL, R. Entwicklung der Placenta vom *Myotis murinus*. SB. Ges. Morph. iv, pp. 114 & 115. Title and discussion only.

HERRERA, D. A. L. Queirópteros de Mexico. Nat. Mex. (2) i, pp. 218-226.

A descriptive list of the Bats of Mexico; 27 species are recognized.

MONTICELLI, F. S. Some Remarks on the Genus *Taphozous*. Ann. N. H. (6) iii, pp. 487-489.

Gives new characters by which the typical representatives of *Taphozous* may be distinguished from the subgenus *Taphonycteris*. A synopsis of the species is given.

I. *MEGACHIROPTERA.*a. *PTEROPODIDÆ.*

JENTINK, F. A. On a New Genus and a New Species in the MacroGLOSSINE Group of Bats. Notes Leyd. Mus. xi, pp. 209-212, pl. ix, figs. 1-4.

Describes a new Fox-Bat from Celebes, which resembles *Eonycteris*, *Nesonycteris*, and *Notopterus*, in the absence of a claw to the index finger, but differs by its dentition, of which the formula is I. $\frac{3}{2}$, C. $\frac{1}{1}$, Pm. $\frac{2}{1}$, M. $\frac{2}{1}$. Its tail is shorter than in *Notopterus*, and the wings do not rise from the central line of the back; it differs from *Eonycteris* by the wing-membrane being attached to the second instead of the first toe; and from *Nesonycteris* by its well-developed tail.

Callinycteris rosenbergi, n. g. & sp., F. A. JENTINK, *op. cit.*, Celebes.

Epomophorus dobsoni, n. sp., J. V. B. DU BOCAGE, J. Sci. Lisb. (2) 1889, p. 1, Renguella, Congo District.

Myonycteris brachycephala, n. sp., BOCAGE, t. c. pp. 197 & 198, I. of St. Thomas.

II. MICROCHIROPTERA.

b. VESPERTILIONIDÆ.

THOMAS, O. Description of a New Bat from the Gambia. Ann. N. H. (6) iii, pp. 362-364, woodcut.

Describes, with figures of head and incisors, a new species of *Vesperugo* (*infra*).

Vespertilio daubentonii and *V. nattereri*: J. E. HARTING, Zool. (3) xiii, pp. 161-166 & 241-248, pls. ii & iii, has notes on these species, with figures.

Vesperugo pagenstecheri, n. sp., T. NOACK, Zool. Jahrb. iv, p. 220, pl. ii, fig. 3, Netouna, S. Africa.

Vesperugo (Vesperus) damarensis, n. sp., NOACK, t. c. p. 213, pl. v, fig. 59, Damaraland, S. Africa.

Vesperugo (Vesperus) pusillus, n. sp., NOACK, t. c. p. 216, pl. ii, fig. 2, Boma, S. Africa.

Vesperugo (Vesperus) rendalli, n. sp., O. THOMAS, Ann. N. H. (6) iii, pp. 362-364, woodcut, Bathurst, on the Gambia.

Vesperugo (Vesperus) bicolor, n. sp., J. V. B. DU BOCAGE, J. Sci. Lisb. (2) i, p. 5, Caconda, Angola.

Vesperugo (Vesperus) guineensis, n. sp., DU BOCAGE, t. c. p. 6, Bissan, Africa.

Vesperugo (Vesperus) arge, n. sp., E. D. COPE, Am. Nat. xxiii, p. 130, S. Brazil.

Chalinolobus congicus, n. sp., T. NOACK, t. c. p. 223, pl. ii, fig. 1, Netouna, S. Africa.

Chalinolobus morio. O. THOMAS, Ann. N. H. (6) iv, p. 462, points out that this is the proper name for the New Zealand Bat generally known as *Chalinolobus tuberculatus*.

Miniopterus newtoni, n. sp., J. V. B. DU BOCAGE, J. Sci. Lisb. (2) 1889, pp. 198 & 199, I. of St. Thomas.

c. EMBALLONURIDÆ.

ALLEN, H. On the Genus *Nyctinomus* and Description of Two New Species. P. Am. Phil. Soc. xxvi, pp. 558-563.

After a brief notice of the distribution of the genus, describes 2 new species, one from Brazil and the other from Jamaica (*vide infra*).

Noctilio leporinus. J. E. HARTING, Field, 1889, April, has notes on the piscivorous habits of this species, with figures of the head, skull, and foot. See also H. CARACCILO, Le Nat. 1889, p. 181; and TROUESSART, t. c. p. 186.

Nyctinomus femorosaccus, n. sp., C. H. MERRIAM, North American Fauna (see p. 11), No. 2, p. 23, fig. 3, Colorado Desert, California.

Nyctinomus moharensis, n. sp., MERRIAM, t. c. p. 25, fig. 4, Arizona.

Nyctinomus europæ, n. sp., H. ALLEN, P. Am. Phil. Soc. xxvi, p. 558, Brazil.

Nyctinomus orthotis, n. sp., H. ALLEN, *l. c.* p. 561, Jamaica.

d. PHYLLOSTOMATIDÆ.

THOMAS, O. Description of a New Stenodermatous Bat from Trinidad. Ann. N. H. (6) iv, pp. 167-171, woodcuts.

Describes a new species of *Vampyrops*, with figures of the dentition (*infra*).

Artibeus (Dermanura) eva, n. sp., E. D. COPE, Am. Nat. xxiii, p. 130, I. of St. Martin, West Indies.

Vampyrops caracciola, n. sp., O. THOMAS, Ann. N. H. (6) iv, pp. 167-171, woodcuts, Trinidad.

5. RODENTIA.

DUVAL, M. Le Placenta des Rongeurs. J. de l'Anat. Phys. xxv, pp. 309-342, pls. xiv & xv, & pp. 573-627, pls. xviii & xix.

A full and detailed account of the placentation of the Rodents.

LATASTE, F. Notes sur Différentes Espèces de l'Ordre des Rongeurs observées en Captivité. Act. Soc. L. Bord. (5) iii, pp. 61-192.

A continuation of previous observations upon the menstruation and other functions of various Rodents. [See Zool. Rec. xxv, *Mamm.* p. 37.]

MORAN, H. Des Transformations Épithéliales de la Muqueuse du Vagin de quelques Rongeurs. J. de l'Anat. Phys. xxv, pp. 277-297, woodcuts.

Observations on the alterations in the epithelium of the vagina in various Rodents.

I. RODENTIA SIMPLICIDENTATA.

a. SCIURIDÆ.

BÜCHNER, E. Ueber das Fehlen des Eichhörnchens im Kaukasus. Mfl. biol. xiii, pp. 75-82.

Commences by quoting Köppen's thesis [see Zool. Rec. xix, *Mamm.* p. 9] that the fauna of the Crimea is derived from that of the Caucasus, as proved by the circumstance that the Squirrel has been unable to migrate from the forests of South Russia across the intervening deserts to the Crimea. Then examines the alleged occurrence of the Squirrel in the Caucasus, and concludes that in all these cases the Dormouse is really meant, and that the Squirrel is unknown there. Hence Köppen's theory falls to the ground.

KAFKA, J. Die diluvialen Murmelthiere in Böhmen. SB. böhm. Ges. 1889, pp. 195-207, woodcuts.

Describes remains of a Marmot from a Pleistocene deposit near Prague, which are referred to *Arctomys bobac*.

NEHRING, A. Ueber fossile *Spermophilus*-Reste von Curve bei Wiesbaden. SB. nat. Fr. 1889, pp. 35-37.

Records remains of *Spermophilus* from these Pleistocene deposits. In an appendix (*l. c.* pp. 37-51) the author concludes that the occurrence of these remains conclusively proves the existence of an arctic Pleistocene climate. A list of the remains of Mammals collected by Wollemann is given.

TRICKERMANN, F. On the Gustatory Organs of *Arctomys monax*. Anat. Anz. iv, pp. 334 & 335.

Describes in detail the tongue, circumvallate papillæ, and foliate papillæ of this Marmot.

Sciurus whiteheadi, O. THOMAS, figured, P. Z. S. 1889, pl. xxiv.

Sciurus alstoni, n. sp., J. A. ALLEN, Bull. Am. Mus. Nat. Hist. ii, pp. 167-170, Sierra de Nayarit, Mexico.

Tamias asiaticus n. var. *bulleri*, ALLEN, *t. c.* pp. 173-176, Mexico.

Tamias asiaticus n. var. *merriami*, ALLEN, *t. c.* pp. 176-178, San Bernardino Mts., California.

Tamias leucurus, n. sp., C. H. MERRIAM, North American Fauna (see p. 11), No. 2, p. 20, California.

Arctomys dacota, n. sp., MERRIAM, *t. c.* p. 8, pl. viii, figs. 7 & 8, Dakotah.

Arctomys monax: an account of the habits of this American species given by W. POHLMANN, Zool. Gart. xxx, pp. 236-243.

Spermophilus moharensis, n. sp., MERRIAM, *t. c.* p. 15, California.

Spermophilus neglectus, n. sp., MERRIAM, *t. c.* p. 17, Arizona.

Spermophilus rufescens, recorded by A. NEHRING, *t. c.* pp. 64 & 65, from Pleistocene, near Frankfurt.

Spermophilus richardsoni: an account of this American species given by W. POHLMANN, Zool. Gart. xxx, pp. 193-197.

b. CASTORIDÆ.

Castor fiber: W. STUART, Sci. Goss. 1889, pp. 135-137, has notes on the colony established by the Marquis of Bute in the Island of Bute; see also A. PORTE, Bull. Soc. Acclim. (4) vi, pp. 5-7. D'ORCET has general notes on this species on pp. 1-4 of the serial last quoted.

c. MYOXIDÆ.

Myoxus glis: C. COESTER, Zool. Gart. xxx, pp. 243-247, continues his account of the habits of the Dormouse in captivity.

d. MURIDÆ.

BOCAGE, J. V. BARBOZA DU. Observations sur l'*Euryotis anchieta*. J. Sci. Lisb. (2) i, pp. 206-208.

Notices variations dependent upon age in the number of the laminae of the teeth of this form, and suggests that it may be only a variety of *E. irroratus*.

BÜCHNER, E. Wissenschaftliche Resultate der von N. M. Przewalski nach Central-Asien Unternommenen Reisen.—Zoologischer Theil. i. Säugethiere, pt. ii. pp. 49–88, pls. vi–xi (pl. ix issued with pt. iii). [See Zool. Rec. xxv, *Mamm.* p. 4.]

This part includes Rodents belonging to the family *Muridae*. The species described are *Sminthus subtilis*, *Gerbillus przewalskii* (pls. i, figs. 10–14, & vi, figs. 1 & 2), *G. unguiculatus*, *G. meridianus*, *G. roborowskii* (pls. v, figs. 1–10, & vi, fig. 3), *G. lepturus* (n. sp., pla. viii, figs. 1–5, & ix, fig. 1), *G. opimus* (pls. vii, fig. 2, & viii, figs. 6–12), *G. giganteus* (n. sp., pls. vii, fig. 1, & viii, figs. 13–20), *Cricetus arenarius* (pls. ix, fig. 2, & xi, figs. 10–13), *C. songarus*, *Nesokia brachyura* (n. sp., pls. x & xi, figs. 1–9), and *Mus wagneri*.

— *Ibid.*, pt. iii, pp. 89–136, pls. xii–xiv (pl. ix issued with this part).

This part continues the description of the *Muridae*. In *Mus* it includes *Mus arianus* and *M. cherrieri*; the name *Microtus* is employed instead of *Arvicola*, the species being *M. fortis* (n. sp., pls. xvi, figs. 1 & 2, & xviii, figs. 1–3), *M. evermanni* (pls. xvi, fig. 3, & xviii, figs. 4–6), *M. tianschanicus* (n. sp., pls. xvi, fig. 4, & xviii, figs. 7–10), *M. limnophilus* (n. sp., pla. xvii, fig. 4, & xviii, figs. 11–13), *M. mandarinus* (pl. xix, figs. 1–3), *M. brandi* (pls. xvii, fig. 1, & xix, fig. 4–6), and *M. strauchi*, n. var., *fuscus* (pls. xvii, fig. 3, & xix, figs. 11–14). *Eremiomy*s is represented by *E. przewalskii* (n. sp., pls. xii, figs. 1 & 2, & xiii, figs. 1–9), and *E. lagurus* (pls. xii, fig. 3, & xiii, figs. 12–16). The part concludes with *Ellobius talpinus* (pls. xiv & xv, figs. 1–11).

HERMANN, F. Ueber die Ergebnisse einer histologischen Untersuchung der Mäuse- und Salamanderhodens. SB. Soc. Erlangen 1888, pp. 47–48.

Gives the histological characters of the spermatoblasts of the Mouse.

LENHOSSEK, M. v. Untersuchungen über die Entwicklung der Markscheiden und der Faserverlauf in Rückenmark der Maus. Arch. mikr. Anat. xxxiii, pp. 71–124, pls. vi & vii.

A detailed account of the development of the neural sheath, &c., in the spinal cord of the Mouse.

ROETTER, F. Ueber Entwicklung und Wachstum der Schneidezähne bei *Mus musculus*. Morph. JB. xv, pp. 457–477, pl. xvii.

Describes in detail the development of the incisors of the Mouse, and discusses the morphological importance of the Rodent incisors.

SHUFELDT, R. W. Observations upon the Development of the Skull in *Neotoma fuscipes*: a Contribution to the Morphology of the Rodentia. P. Ac. Philad. 1889, pp. 14–28, pls. i & ii.

Describes in detail the ossification of the bones in a foetal skull, with figures.

THOMAS, O. Description of a New Genus of *Muridae* allied to *Hydromys*. P. Z. S. 1889, pp. 247–250, pl. xxix.

Describes, with figures of the skull, teeth, and feet, a Murine from

Queensland, under the name of *Xeromys*, which agrees in the structure of the skull and the unwebbed feet with *Mus*, but resembles *Hydromys* in the number (2) and structure of the molars (*vide infra*).

[THOMAS, O.] Description of a New Species of *Mus* from South Australia. Ann. N. H. (6) iii, pp. 433-435, woodcut.

Describes, with enlarged figure of the cheek-dentition, a Murine from S. Australia as *Mus argurus*, which has the skull and external characters of *Mus*, but the cheek-teeth of *Hapalotis*. It is suggested that these features may eventually necessitate the inclusion of the latter genus in the former (*infra*).

Gerbillus przevalskii [Zool. Rec. xxv, Mamm. p. 40] described and figured by E. BÜCHNER (*suprà*, p. 30), p. 51, pls. x, figs. 10-14, & vi, figs. 1 & 2.

Gerbillus roborowskii [Zool. Rec. l.c.] described and figured by BÜCHNER, t. c. p. 63, pls. v, figs. 1-10, & vi, fig. 3.

Gerbillus lepturus, n. sp., BÜCHNER, t. c. p. 67, pls. viii, fig. 1, & ix, fig. 1, Central Asia.

Gerbillus opimus, figured by BÜCHNER, t. c. pls. vii, fig. 2, & viii, figs. 6-12.

Gerbillus giganteus, n. sp., BÜCHNER, t. c. p. 73, pls. vii, fig. 1, & viii, figs. 13-20, Central Asia.

Gerbillus tenuis, n. var. *schinzi*, T. NOACK, Zool. Jahrb. iv, p. 134, pl. iii, figs. 13-16, Kalahari, S. Africa.

Mus rattus: a note on its occurrence in Bremen given in Zool. Gart. xxx, pp. 26 & 27, and in North-West Germany on pp. 92 & 93 of the same.

Mus hibernicus: a note on this form, taken from BROWN & BUCKLEY's Fauna of the Outer Hebrides (*suprà*, p. 5), is published in Zool. (3) xiii, pp. 201-206; on pp. 321 & 322 of the same vol. T. SOUTHWELL has further notes on this Rat, which he figures, and considers that it is a hybrid.

Mus (Micromys) microdontoides, n. sp., T. NOACK, Zool. Jahrb. iv, p. 141, pl. ii, fig. 4, Banana, S. Africa.

Mus argurus, n. sp., O. THOMAS, Ann. N. H. (6) iii, pp. 433-435, woodcut, S. Australia.

Nesokia brachyura, n. sp., BÜCHNER, t. c. p. 82, pls. x & xi, figs. 1-9, Lob-nor, Central Asia.

Nesokia boettgeri, n. sp., G. RADDE & A. WALTER, Zool. Jahrb., Abth. f. Syst. iv, p. 1036, Amu-darya.

Sigmodon hispidus, n. var. *littoralis*, F. M. CHAPMAN, t. c. p. 118, Florida.

Sigmodon fulvirenter, n. sp., J. A. ALLEN, Bull. Am. Mus. Nat. Hist. ii, pp. 180 & 181, Mexico.

Cricetus frumentarius: C. STRUCK-WAREN, Arch. Ver. Mecklenb. xlii, pp. 103-106, has notes on its occurrence in Mecklenburg.

Cricetus arenarius, figured by BÜCHNER, t. c. pls. ix, figs. 2 & 3, & xi, figs. 10-13.

Hesperomys floridanus, n. sp., F. M. CHAPMAN, Bull. Am. Mus. Nat. Hist. ii, p. 117, Florida.

Hesperomys niveiventris, n. sp., CHAPMAN, l. c., Florida.

Onychomys longipes, n. sp., C. H. MERRIAM, North American Fauna (see p. 11), No. 2, p. 1, Texas.

Onychomys longicaudus, n. sp., MERRIAM, t. c., p. 2, pl. i, figs. 8 & 9, Utah.

Onychomys longicaudus, n. var. *melanophrys*, MERRIAM, t. c. p. 2, Utah.

Phenacomys intermedius, n. g. & sp., MERRIAM, t. c. p. 32, pls. iv, fig. 11, & vi & vii, British Columbia.

Phenacomys celatus, n. sp., MERRIAM, t. c. p. 33, pls. ii, figs. 1-3, iii, figs. 6 & 7, & iv, fig. 13, Godbout, Canada.

Phenacomys latimanus, n. sp., MERRIAM, t. c. p. 34, pls. ii, fig. 5, & iv, fig. 12, Fort Chimo, Hudson Bay.

Phenacomys ungava, n. sp., MERRIAM, t. c. pls. ii, fig. 4, & iii, figs. 8 & 9, *ibid.*

Arvicola pallidus [Zool. Rec. xxv, *Mamm.* p. 40] : figure of cranium given by C. H. MERRIAM, Am. Nat. xxiii, p. 60, the figure in the original description being that of *A. minor*.

Microtus (= *Arvicola*) *fortis*, n. sp., BÜCHNER, t. c. p. 99, pls. xvi, figs. 1 & 2, & xviii, figs. 1-3, Central Asia.

Microtus tianschanicus, n. sp., BÜCHNER, t. c. p. 107, pls. xvi, fig. 4, & xviii, figs. 7-10, *ibid.*

Microtus limnophilus, n. sp., BÜCHNER, t. c. p. 111, pls. xvii, fig. 4, & xviii, figs. 11-13, *ibid.*

Microtus strauchi, n. var. *fuscus*, BÜCHNER, t. c. p. 125, pls. xvii, fig. 3, & xix, figs. 11-14, *ibid.*

† *Ptyssophorus elegans*, n. g. & sp., F. AMEGHINO, t. c. (*supra*, p. 2), p. 111, pl. iv, fig. 1, Tertiary, Argentine.

† *Oryzomys impexus*, n. sp., AMEGHINO, t. c. p. 113, pl. iv, fig. 3, *ibid.*

† *Ilabrothrix internus*, n. sp., AMEGHINO, t. c. p. 114, pl. iv, figs. 5 & 6, *ibid.*

† *Holochilus multannus*, n. sp., AMEGHINO, t. c. p. 117, pl. iv, fig. 12, *ibid.*

† *Bothriomys catenatus*, n. g. & sp., AMEGHINO, t. c. p. 118, pl. iv, fig. 13, *ibid.*

† *Tretomys atavus*, n. g. & sp., AMEGHINO, t. c. p. 119, pl. iv, fig. 16, *ibid.*

† *Necomys conifer*, n. g. & sp., AMEGHINO, t. c. p. 120, pl. iv, figs. 17 & 18, *ibid.*

Neofiber alleni : notes on its habits given by F. M. CHAPMAN, Bull. Am. Mus. Nat. Hist. ii, pp. 119-122, with measurements of skulls and skins ; it is stated to be much less aquatic than *Fiber*. F. C. BAKER has supplemental notes ; P. Ac. Philad. 1889, pp. 271-273.

Eremiomys przewalskii, n. sp., BÜCHNER, t. c. p. 127, pls. xii, figs. 1 & 2, & xiii, figs. 1-3, Central Asia.

Ellobius talpinus figured by BÜCHNER, t. c. pl. xiv.

Xromys myoides, n. g. & sp., O. THOMAS, P. Z. S. 1889, p. 248, pl. xxix, Port Mackay, Queensland.

c. GEOMYIDÆ.

For a monograph of the genus *Perognathus*, see C. H. MERRIAM, p. 11.

f. SPALACIDÆ.

Georychus capensis: P. L. SCLATER, P. Z. S. 1839, p. 419, records an albino specimen.

g. OCTODONTIDÆ.

Echinomys semispinosus recorded by F. W. TRUE, P. U. S. Nat. Mus. x, pp. 467 & 468 (1888), from Nicaragua: this being the only authenticated occurrence of a member of this family in Central America.

Capromys brachyurus, n. var. *thoracatus*; F. W. TRUE, t. c. p. 469, Swan Is., off Honduras.

Dactylomys amblyonyx: an account of this species given by E. A. GÖLDI, Zool. Gart. xxx, pp. 225-233.

†*Neoremys insulatus*, n. sp., F. AMEGHINO, t. c. (*suprà*, p. 2), p. 138, pl. vii, fig. 20, Tertiary, Argentine.

†*Olenopsis uncinus*, n. g. & sp., AMEGHINO, t. c. p. 145, pl. vi, figs. 14-16, *ibid*.

†*Discolomys cuneus*, n. g. & sp., AMEGHINO, t. c. p. 148, pl. xxv, fig. 8, *ibid*.

†*Pithanotomys cordubensis*, n. sp., AMEGHINO, t. c. p. 165, pl. vii, fig. 18, *ibid*.

Myopotamus coypu: — HAGMANN, Zool. Gart. xxx, pp. 8-14, has notes on the habits of this species in captivity.

†*Myopotamus obesus*, n. sp., AMEGHINO, t. c. p. 900, pl. lxxii, fig. 3, *ibid*.

h. HYSTRICIDÆ.

Trichys guentheri, n. n.: O. THOMAS, P. Z. S. 1889, p. 235, to replace *T. lipura*, which is considered inapplicable. Notes on this species (*T. lipura*) are given by A. GÜNTHER, t. c. pp. 75-77, with a figure illustrating the arrangement of the scales and hairs on the tail.

Sphingurus sericeus, n. sp., E. D. COPE, Am. Nat. xxiii, p. 136, S. Brazil.

†*Paradozomys cancrivorus*, n. g. & sp., F. AMEGHINO, t. c. (*suprà*, p. 2), p. 122, pl. xxii, fig. 15, Tertiary, Argentine.

†*Acaremys messor*, n. sp., AMEGHINO, t. c. p. 126, pl. iv, fig. 21, *ibid*.

i. DASYPROCTIDÆ.

Dasyprocta aurea, n. sp., E. D. COPE, Am. Nat. xxiii, p. 138, S. Brazil.

j. CHINCHILLIDÆ.

†*Perimys scalabrinianus*, n. sp., F. AMEGHINO, t. c. (*suprà*, p. 2), p. 903, pl. lxxii, fig. 16, Tertiary, Argentine.

†*Perimys procerus*, n. sp., AMEGHINO, t. c. p. 172, pl. ix, figs. 25 & 26, *ibid*.

†*Lagostomus debilis*, n. sp., AMEGHINO, t. c. p. 179, pl. ix, fig. 5, *ibid*.

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- †*Lagostomus minimus*, n. sp., AMEGHINO, *t. c.* p. 180, pl. ix, fig. 6, *ibid.*
 †*Lagostomus cavifrons*, n. sp., AMEGHINO, *t. c.* p. 180, pl. viii, fig. 2, *ibid.*
 †*Lagostomus heterogenidens*, n. sp., AMEGHINO, *t. c.* p. 182, pl. ix, fig. 7, *ibid.*
 †*Lagostomus lateralis*, n. sp., AMEGHINO, *t. c.* p. 185, pl. ix, fig. 10, *ibid.*
 †*Lagostomus primigenius*, n. sp., AMEGHINO, *t. c.* p. 186, pl. ix, fig. 11, *ibid.*
 †*Euphilus ambrossettianus*, n. g. & sp., AMEGHINO, *t. c.* p. 903, pl. lxii, fig. 7, *ibid.*
 †*Euphilus kurtzi*, n. sp., AMEGHINO, *t. c.*, p. 904, pl. lxii, fig. 13, *ibid.*
 †*Briaromys trouessartianus*, n. g. & sp., AMEGHINO, *t. c.* p. 904, pl. lxii, fig. 15, *ibid.*
 †*Neoeppibema contorta*, n. sp., AMEGHINO, *t. c.* p. 907, pl. lxxx, fig. 1, *ibid.*

k. CAVIIDÆ.

NEHRING, H. Ueber die Herkunft des Meerschweinchens (*Cavia cobaya*). SB. nat. Fr. 1889, pp. 1-4, woodcut.

Considers that the domestic Guinea Pig is derived from the Peruvian *Cavia cutleri*, and not from *C. porcellus (aperca)*, of Brazil, as is generally supposed. [See also H. BRÉZOL, Bull. Soc. Acclim. (4) vi, pp. 745-749.]

FRIEDEL, E. Zur Familien und Lebens-Geschichte des Meerschweinchens, *Cavia cobaya*. Zool. Gart. xxx, pp. 97-108.

An account of the history, origin, and mode of life of the Guinea Pig.

- †*Orthomyctera vaga*, n. g. & sp., F. AMEGHINO, *t. c.* (*suprà*, p. 2), pp. 218 & 219, pls. xi & xii, Tertiary, Argentine.
 †*Orthomyctera lata*, n. sp., AMEGHINO, *t. c.* p. 220, pl. xi, fig. 4, *ibid.*
 †*Dolichotis intermedia*, n. sp., AMEGHINO, *t. c.* p. 222, pl. ix, fig. 3, *ibid.*
 †*Dolichotis platycephala*, n. sp., AMEGHINO, *t. c.* p. 223, pl. xi, fig. 8.
 †*Cerodon turgeo*, n. sp., AMEGHINO, *t. c.* p. 225, pl. xii, fig. 20, *ibid.*
 †*Cerodon priscus*, n. sp., AMEGHINO, *t. c.* p. 226, pl. xii, fig. 22, *ibid.*
 †*Cerodon pygmaeus*, n. sp., AMEGHINO, *t. c.* p. 226, pl. xii, fig. 21, *ibid.*
 †*Microcavia uncinata*, n. sp., AMEGHINO, *t. c.* p. 230, pl. xii, fig. 16, *ibid.*
 †*Palæocavia impar*, n. g., AMEGHINO, *t. c.* p. 231, type *Cavia impar*, *ibid.*
 †*Palæocavia pampæa*, n. sp., AMEGHINO, *t. c.* p. 233, pl. xii, fig. 9, *ibid.*
 †*Palæocavia minuta*, n. sp., AMEGHINO, *t. c.* p. 233, pl. xii, fig. 8, *ibid.*
 †*Neoprocavia*, n. n., AMEGHINO, *t. c.* p. 235, to replace the preoccupied *Procavia*.
 †*Plexochaerus adluis*, n. sp., AMEGHINO, *t. c.* p. 252, pl. xxv, fig. 1, *ibid.*
 †*Plexochaerus lynchi*, n. sp., AMEGHINO, *t. c.* p. 910, pl. lxxix, fig. 6, *ibid.*
 †*Hydrochaerus irroratus*, n. sp., AMEGHINO, *t. c.* p. 911, pl. lxxix, figs. 7 & 8, *ibid.*

Family Uncertain.

† *Callodontomys vastatus*, n. g. & sp., AMEGHINO, *t. c.* p. 259, pl. ix, fig. 7, Tertiary, Argentine.

II. RODENTIA DUPLICIDENTATA.

l. LEPORIDÆ.

LIEBE, K. T. Gefangene Wildkaninchen. Zool. Gart. xxx, pp. 65-76.

Notes on the habits of Wild Rabbits in captivity

MASIUS, J. De la Genèse du Placenta chez le Lapin. Arch. Biol. ix, pp. 83-121, pls. v-viii.

After an elaborate account of its structure, the author concludes that the placenta of the Rabbit is entirely of fetal origin, formed by the allantoic villi branching in a tissue derived solely from the epiblast of the embryo.

† *Lepus valdarnensis*, n. sp., K. A. WEITHOFER, JB. géol. Reichsanst. xxxix, p. 80, Pliocene, Tuscany.

m. LAGOMYIDÆ.

Lagomys schisticeps, n. sp., C. H. MERRIAM, North American Fauna (see p. 11), No. 2, p. 12, pl. viii, figs. 1-4, Sierra Nevada, California.

6. UNGULATA.

AULD, R. C. Some cases of Solid-Hoofed Hogs and Two-Toed Horses. Am. Nat. xxiii, pp. 447-449, woodcuts.

Gives a figure of the foot of a Pig with the two middle toes enclosed in a single hoof, and states that a breed of Pigs with this peculiarity occurs both in Texas and Iowa. Also records two instances of Horses with extra toes.

.I. PROBOSCIDEA.

BAUR, G. Bemerkungen über den Carpus der Proboscidi und der Ungulaten in Allgemeinen. Morph. JB. xv, pp. 478-482, woodcut.

Criticizes Weithofer's paper on the Proboscidian carpus [Zool. Rec. xxv, Mamm. p. 42], and figures the manus of an Elephant in which the scaphoid consists of two separate elements, representing the radiale and centrale. Concludes with general remarks as to the relationship of the Proboscidian carpus to that of other Ungulates, in which it is argued that the Proboscidea are descended directly either from the *Tazeopoda* (*Ilyra-coidea* and *Condylarthra*) or from a group intermediate between this and the *Amblypoda*.

COPE, E. D. The Proboscidea. Am. Nat. xxiii, pp. 191-211, illustr. See also Geol. Mag. (3) vi, pp. 438-448.

A general review of the structure of the Proboscidea, with an enumeration of all the genera and species. The author divides the *Elephantida*

into the genera *Tetrabelodon*, *Dibelodon*, *Mastodon*, *Emmenodon*, and *Elephas*. The term *Emmenodon* is a new one proposed for *Elephas clifti* [apparently the type of *Stegodon*—R. L.], and also includes *E. planifrons*. *Mastodon* (*Tetrabelodon*) *proavus* is regarded as a variety of *M. angustidens*; and it is considered probable that *Elephas americanus* and *E. columbi* are only varieties of the Mammoth. One new species of *Mastodon* (*Tetrabelodon*) is described. A number of illustrations are given of skulls and teeth. (*Vide infra*.)

a. ELEPHANTIDÆ.

GALIPPE, V. Examen d'une Molaire d'Éléphant et des ses Moyens de Fixation au Maxillaire. C.R. Soc. Biol. (9) i, pp. 559–564, and C.R. cix, pp. 162–164.

Describes the soft structures by which the molars of the Elephant are attached to the bone of the jaw.

NAUMANN, E. Fossile Elephantenreste von Mindanão, Sumátra, und Malakka. Anh. zool. Mus. Dresden, 1886–87, art. 6, 11 pp., 1 pl. [Omitted from Zool. Rec. xxiv.]

Describes and figures teeth of Stegodont Elephants from the Pliocene of Java, a tusk from that of Java, and remains from Bank referred to *Elephas indicus*.

†*Mastodon cordillerum* (*andium*). Skulls figured by H. BURMEISTER (*suprà*, p. 5) to show short and edentulous mandibular symphysis.

†*Mastodon angustidens*: A. GAUDRY, C.R. cviii, pp. 1293 & 1294, has notes on a nearly complete skull from the Miocene of Tournan (Gers) recently acquired by the Paris Museum.

†*Mastodon* (?) *Tetrabelodon*) *brevidens*, n. sp., E. D. COPE, Am. Nat. xxiii, pp. 195, 201, & 202, fig. 5, Pliocene, Montana.

†*Mastodon rectus*, n. sp., F. AMEGHINO, *l. c.* (*suprà*, p. 2), p. 643, Tertiary, Argentine.

†*Emmenodon*, n. g., E. D. COPE, Am. Nat. xxiii, p. 194; type, *Elephas clifti*, Falc. & Caut., Pliocene, India.

†*Elephas primigenius*: a tusk from the valley of the Darent recorded by J. PRESTWICH, Geol. Mag. (3) vi, pp. 113 & 114.

†*Elephas lyrodon*, n. sp., K. A. WEITHOFER, JB. geol. Reichsanst. xxxix, p. 80, Pliocene, Tuscany.

†*Elephas americanus*: G. E. CULVER, Science, xiv, p. 103, notes the discovery of part of a skeleton on the Missouri, near Vermillion, Dakota.

†*Elephas meridionalis*: J. C. MANSEL-PLEYDELL, P. Dorset N. H. Club, x, pp. 1–18, 3 pls., has notes on remains of this species found at Dawlish, Dorset.

II. AMBLYPODA.

b. UINTATHERIIDÆ.

†*Uintatherium* (*Dinoceras*) *mirabile*: a note on Marsh's restoration of the skeleton given by A. GAUDRY, C.R. cviii, p. 1292; see also M. BOULE, Le Nat. 1889, pp. 184 & 185.

III. HYRACOIDEA.

c. HYRACIDÆ.

BOCAGE, J. V. BARBOZA DU. Les Damans d'Angola. J. Sci. Lisb. (2) 1889, pp. 186-196, & pl.

Describes (with figures of skull) *Hyrax velwitschii* and *H. (Heterohyrax) bocagei*, and gives a diagnosis of a new species of *Dendrohyrax*. Concludes with a list of the known forms of the family.

Dendrohyrax grayi, n. sp., J. V. B. DU BOCAGE, t. c. pp. 190-192, Benguela, Congo Valley.

IV. CONDYLARTHRA.

d. MENISCOTHEREIIDÆ.

LYDEKKER, R. On an apparently new Species of *Hyracodontotherium*. P. Z. S. 1889, pp. 67-69, woodcut.

Describes and figures an upper jaw from the Quercy Phosphorites which is considered to indicate a new species of this genus.

†*Hyracodontotherium filholi*, n. sp., LYDEKKER, l. c., Quercy Phosphorites, Central France.

V. TOXODONTIA.

e. TOXODONTIDÆ.

†*Trigodon gaudryi*: the specimens described by Ameghino as *Taxodontotherium* and *Haplodontotherium* are stated by F. B. MORENO, Bol. Mus. la Plata, 1889, pp. 30-37, to be identical with *Trigodon*.

†*Pseudotoxodon formosus*, n. g. & sp., F. P. MORENO, t. c. p. 36, Tertiary, Argentine.

†*Eutomodus*, n. n., F. AMEGHINO, t. c. (*suprà*, p. 2), p. 403, to replace *Tomodus*, preoccupied.

†*Toxodon[to]therium reverendum*, n. sp., AMEGHINO, t. c. p. 915, pl. xevi, fig. 1, Tertiary, Argentine.

f. TYPOTHERIIDÆ.

†*Entelomorphus rotundatus*, n. g. & sp., F. AMEGHINO, t. c. (*suprà*, p. 2), p. 421, pl. xvii, fig. 8, Tertiary, Argentine.

†*Pachyrucus teres*, n. sp., AMEGHINO, t. c. p. 429, pl. xiii, fig. 25, *ibid*.

†*Pachyrucus trivius*, n. sp., AMEGHINO, t. c. p. 429, pl. xiii, fig. 31, *ibid*.

†*Pachyrucus absis*, n. sp., AMEGHINO, t. c. p. 429, pl. xiii, figs. 32 & 33, *ibid*.

†*Pachyrucus navius*, n. sp., AMEGHINO, t. c. p. 430, pl. xiii, fig. 30, *ibid*.

†*Pachyrucus ictus*, n. sp., AMEGHINO, t. c. p. 431, pl. xiii, figs. 17 & 18, *ibid*.

†*Icochilus extensus*, n. g. & sp., AMEGHINO, *t. c.* pp. 469-471, pl. xv. figs. 4-9, *ibid.*

†*Icochilus excavatus*, n. sp., AMEGHINO, *t. c.* p. 472, pl. xv, figs. 10-13, *ibid.*

†*Icochilus undulatus*, n. sp., AMEGHINO, *t. c.* p. 473, pl. xv, fig. 14, *ibid.*

†*Icochilus rotundatus*, n. sp., AMEGHINO, *t. c.* p. 473, pl. xv, fig. 15 & 16, *ibid.*

†*Protyppotherium claudum*, n. sp., AMEGHINO, *t. c.* p. 480, pl. xiv. fig. 22, *ibid.*

†*Patriarchus palmideus*, n. g. & sp., AMEGHINO, *t. c.* pp. 480 & 481, pl. xv, figs. 2 & 3, *ibid.*

VI. PERISSODACTYLA.

g. TAPIRIDÆ.

BEDDARD, F. E. Notes upon the Anatomy of the American Tapir (*Tapirus terrestris*). P. Z. S. 1889, pp. 252-258, woodcuts.

Describes, with figures, the alimentary tract and brain, as deduced from the dissection of two specimens. The comparatively simple convolutions of the brain (as compared with the Horse and Rhinoceros) appear to be indicative of a low organization.

TELLER, F. *Tapirus hungaricus*, Meyer, aus dem Tertiär-becken von Schönstein bei Cilli in Südsteiermark. JB. geol. Reichsanst. xxxviii. pp. 729-772, pls. xiv & xv. [Abstract in Verh. geol. Reichsanst. 1889, p. 90.]

K. A. WEITHOFER, Verh. geol. Reichsanst. 1889, pp. 179-189, has notes on the jaw of a Tapir from a Tertiary deposit in Upper Austria.

h. PALÆOTHEIIDÆ.

†*Anchitherium westoni*, n. sp., E. D. COPE, Am. Nat. xxiii, p. 153, White River Miocene, Canada.

i. EQUIDÆ.

For the South American Tertiary species, see H. BURMEISTER, *suprà*, p. 5.

BONNET, —. Die Eihäute des Pferdes. Verh. Anat. Ges. Berl. 1889, pp. 17-38, woodcuts.

An elaborate account of the egg-membranes in the Horse.

COPE, E. D. A Review of the North American Species of *Hippotherium*. P. Am. Phil. Soc. xxi, pp. 439-458, 3 pls.

The author adopts the name *Hippotherium*, in place of the earlier *Hipparion*, on account of the insufficient description of the latter, and refers the genus to the *Palæotheriidae*. The name *H. primigenium* is adopted in lieu of *H. gracile* for the common European species. Fifteen North American representatives of the genus are recognized, ranging from the Lower Pliocene to the Loup Fork Beds.

KLEVER, E. Zur Kenntniss der Morphogenese des Equidengebisses. Morph. JB. xv, pp. 308-330, pls. xi-xiii.

Describes and figures the evolution of the constituents of the cheek-teeth of *Equus* in various stages of development. Discusses the bearing of the facts recorded on the phylogenetic relationship of the genera of *Equidae* and allied *Perissodactyles*. From the resemblance of the section of the base of the crown of the upper milk-molars of *Equus* to the molars of *Merychippus* [*Protohippus*], and their dissimilarity to those of *Hipparion*, it is inferred that *Equus* has passed through a Palæotheroid and Merychippoid stage, and that Pavlow is right in regarding *Hipparion* as out of the direct line.

*WILCKENS, M. Ueber die Vererbung der Haarfarbe und deren Beziehung zur Formvererbung bei Pferden. Land. Jahrbüch, xvii, pp. 555-576.

Reviewed in Biol. Centralbl. ix, pp. 223 & 224.

Equus caballus: A. v. MOJSISOVICS, Anat. Anz. pp. 255 & 256, records an instance of polydactylism.

†*Equus intermedius*, n. sp., M. MOURLON, Bull. Ac. Belg. (3) xvii, p. 144, woodcut, Pleistocene, Belgium.

†*Hippidium nunum*, n. sp., H. BURMEISTER t. c. (*supra*, p. 5), p. 10. pl. xi, Pleistocene, Tarija, Bolivia.

†*Hippidium angulatus* [um], n. sp., F. AMEGHINO, t. c. (*supra*, p. 2) p. 520, pl. xxvii, figs. 2 & 3, Tertiary, Argentine.

j. RHINOCEROTIDÆ.

BEDDARD, F. E., & TREVES, F. On the Anatomy of *Rhinoceros sumatrensis*. P. Z. S. 1889, pp. 7-25, woodcuts.

This paper is based on the dissection of a male and female formerly living in the Zoological Society's Gardens. The visceral anatomy having been previously described by Garrod is only briefly mentioned, but a figure of the hard palate is given. Full descriptions and illustrations of the muscles of the limbs are given, and these are compared with the corresponding muscles of the Horse and Tapir. The muscles of the head and neck are treated of less fully.

Rhinoceros sumatrensis. The Field, March 2nd, 1889, records the birth of a young one of this species in the Calcutta Zoological Gardens, the father being the true *R. sumatrensis*, and the mother the so-called *R. lasioides*.

Rhinoceros bicornis: W. H. FLOWER, P. Z. S. 1889, pp. 418 & 419, describes and figures an abnormal third horn behind the two normal horns.

†*Elasmotherium sibiricum*:—RÖMER, J. Ber. schles. Ges. lxvi, pp. 91 & 92, has notes on a skull.

†*Amynodon intermedius*, n. sp., W. B. SCOTT, Tr. Am. Phil. Soc. xvi, p. 508, pl. x, Eocene, U.S.A.

k. TITANOTHERIIDÆ.

†*Titanotherium (Brontops) robustum* : notes, with a figure, on the skeleton are given by O. C. MARSH, *Am. J. Sci.* (3) xxxvii, pp. 163-165, pl. vi, and *Geol. Mag.* (3) vi, pp. 99-101, pl. iv. [See also *Rep. Brit. Ass.* 1889, pp. 706 & 707.]

l. LAMBDOOTHERIIDÆ.

†*Haplacodon angustigenis*, n. g., E. D. COPE, *Am. Nat.* xxiii, p. 153; type, *Menodus angustigenis*, Cope, White River Miocene, Canada.

†*Palæosyops hyognathus*, n. sp., W. B. SCOTT, *Tr. Am. Phil. Soc.* xvi, p. 513, Eocene, U.S.A.

m. CHALICOTHERIIDÆ.

[Regarded by E. D. COPE as a distinct order under the name of *Ancylopoda*.]

†*Chalicotherium bilobatum*, n. sp., E. D. COPE, *Am. Nat.* xxiii, p. 151, White River Miocene, Canada.

Another species of *Chalicotherium* recorded by same writer, *l. c.* p. 152, from Loup Fork Beds of Canada; while *Moropus* is considered to belong to this family.

n. MACRAUCHENIIDÆ.

[See H. BURMEISTER, *suprà*, p. 5.]

VII. ARTIODACTYLA.

BRANDT, A. Ein secundärer Knochenzapfen als Bestandtheil des Horns der Cavicornier. *Zool. Anz.* xii, pp. 195-197.

Discusses the morphological relationship of horns and antlers, as exemplified in the *Bovidae*, *Antilocapridæ*, *Cervidae*, and *Giraffidae*.

BRÉZOL, H. L'Age du Chevreuil, du Cerf, et du Sanglier par le Examen des Dents. *Bull. Soc. Acclim.* (4) vi, pp. 956-960.

A summary of the observations of Nehring as to the means of determining the ages of these animals by the state of the dentition. [See *Zool. Rec.* xxv, *Mamm.* p. 53.]

HUER, A. Liste des Espèces dans les Familles des Cervidés, Cervulidés, Tragulidés, et des Moschidés. *T. c.* pp. 521-533, 665-670, 809-817, & 873-883.

The completion of the memoir quoted in *Zool. Rec.* xxv, *Mamm.* p. 49.

LYDEKKER, R. Note on the Pelvis of a Ruminant from the Siwaliks. *Rec. Geol. Surv. Ind.* xxii, pp. 212-214, woodcut.

Shows that an imperfect bone, which had given rise to several discussions as to its affinity, is really part of the pelvis of an Artiodactyle Ungulate--probably an Antelope.

RÜTIMEYER, L. Ueber das Torfschwein und das Torfrind. Verh. anthropol. Ges. 1888, pp. 550-556.

Controverses the statement of Nehring [Zool. Rec. xxv, *Mamm.* p. 54] that *Sus palustris* and *Bos brachyceros* of the Pfahlbauten are not valid species.

A. NEHRING, in the same serial, 1889, pp. 363-369, replies to the above in support of his previously expressed views. The opinion of Middendorff is quoted that both *Bos primigenius* and *B. brachyceros* are merely races of *B. taurus* (*vide infra*).

o. BOVIDÆ.

AULD, R. C. The Segregations of Polled Races in America. Am. Nat. xxiii, pp. 677-686.

Further observations on the origin of hornless races of cattle.

HELLER, K. M. Die Urbüffel von Celébes : *Anoa depressicornis*, H. Smith. Dresden : 4to, 40 pp., 3 pls.

A full monograph of the *Anoa*, with a discussion of its relationship to the true Buffalo, and to the extinct Indian species described as *Probubalus*.

°HITTCHE, C. Untersuchungen von Schädeln der Gattung *Bos*, unter besonderer Berücksichtigung einiger in östpreussischen Torfmooren gefundener Rinderschädel. Königsberg : 1888, 8vo, 150 pp., pl.

HORNADAY, W. T. The Extirpation of the American Bison. Rep. U. S. Nat. Mus. 1886-87, pp. 369-548, pl. i-xxii (1889).

A general account of the American Bison, with details of the gradual constriction of its area, and the final extirpation of the northern and southern herds. Numerous illustrations from mounted specimens are given, as well as a map of its distribution. Reviewed in *Nature*, xlii, pp. 11-13.

LANGKAVEL, B. Verwilderte Rinder. Zool. Gart. xxx, pp. 53-58.

Notes on various races of feral cattle.

KRAMER, E. *Bos priscus*, Boj., i njegovo odnošenje napram nekih drugih Bovida. Rad. jugoslav. akad. xcv, pp. 178-187, pls. ii & iii.

A paper on the relations of the Pleistocene Bison of Europe to other Bovines, with figures of skulls.

MIDDENDORFF, A. Ueber die Rindviehrasse des nördlichen Russlands. Landw. JB. 1888, pp. 267-328.

Concludes that there are two chief races of European Oxen, both of which are varieties of *Bos taurus*, viz. (1st) A Lowland race (*Bos taurus primigenius*), to which belong the cattle of Western Europe, those of Russia and the Steppes, as well as those of the primitive forest regions. (2nd) A Highland race (*Bos taurus brachyceros*), which has given origin to the cattle of Southern Europe, and probably of North Africa.

SCLATER, P. L. Description of Hunter's Antelope. P. Z. S. 1889, pp. 372-377.

Describes and figures specimens of the skin and skulls of this new Antelope, which is referred to the genus, *Damalis*, if separate from *Alcelaphus*, but exhibits some approximation to the typical forms of the latter (*vide infra*).

† *Bison alticornis* [Zool. Rec. xxiv, *Mamm.* p. 44]. E. D. COPE, *Science*, xiii, p. 290, states that the remains on which this species was founded are really from the Laramie Cretaceous, and belong to a Dinosaurian Reptile. This is admitted by O. C. MARSH, *Am. J. Sci.* (3) xxxviii, p. 174.

† *Bos taurus*, var. *primigenius* : A. NEHRING, *SB. nat.* Fr. 1889, pp. 5-7, has remarks upon skulls of unusually large size.

Bos gaurus : J. D. INVERARITY, *J. Bomb. N. H. Soc.* iv, pp. 294-310, has sporting notes on this species, with two plates of skulls.

Anoa mindorensis, n. sp., — STEERE [see *Zool. Gart.* xxx, p. 221], Philippines.

Connocartes gnu : F. E. BLAAUW, P. Z. S. 1889, pp. 2-5, woodcuts, illustrates the development of the horns, and the gradual acquisition of their peculiar downward curvature.

Damalis hunteri, n. sp., P. L. SCLATER, P. Z. S. 1889, pp. 58-372, pl. xlii, and woodcuts, N. E. Africa.

Antelope triangularis, n. sp., A. GÜNTHER, *t. c.* pp. 73-75, woodcut of horns (all known), S. Africa.

† *Helicophora*, n. n. : K. A. WEITHOFER, *JB. geol. Reichsanst.* xxxix, p. 79, note 1, to replace *Helicoceros* [Zool. Rec. xxv, *Mamm.* p. 51], preoccupied.

Ovis nahura : notes on this species (*Pseudois nahura*), by B. LANGKAVEL, *Zool. Gart.* xxx, pp. 298-302.

BEHREND, W. J. Die Zwergmoschustier des Zool. Gartens zu Frankfurt a. M. *Zool. Gart.* xxx, pp. 321-326.

Notes on the specimens of *Tragulus* in the Zoological Gardens at Frankfurt.

p. ANTILOCAPRIDÆ.

Antilocapra americana : H. L. WARD, *Science*, xiii, pp. 70 & 71, has a note to the effect that the shedding of the horns is a normal feature.

q. GIRAFFIDÆ.

RODLER, A. Ueber *Urmiatherium polaki*, einen neuen Sivatheriiden aus dem Knochenfelde von Maragha. *Denk. Ak. Wien.* lvi, pp. 307-314, 4 pls.

Describes and figures the occipital region of a skull from the Pliocene of Maragha, Persia, upon the evidence of which the genus *Urmiatherium* [Zool. Rec. xxv, *Mamm.* p. 32] was founded (*vide infra*).

† *Urmitherium polaki*, n. sp., A. RODLER, *op. cit.*, Lower Pliocene, Maragha, Persia.

r. CERVIDÆ.

MOJSISOVICS, A. v. Ueber die Geweihbildung des Hochwildes von Bélye, Dritte Mittheilung. MT. Ver. Steierm. 1888, pp. 53-73, woodcuts (1889).

This communication contains the results of the author's observation of the growth of the antlers of the Red Deer, made during the years 1887 and 1888. It comprises a number of elaborate tables of measurements, and is illustrated with figures of the antlers in various stages of growth.

NEHRING, A. Die Gebissentwicklung des Reh- Rot- und Schwarzwildes als Hilfsmittel zur Altersbestimmung. Fortwiss. Centralbl. xxxiii, pp. 231-243, woodcuts.

A paper based on the author's previous observations, showing the date of appearance of the individual teeth in the Roe, Red Deer, and Wild Boar.

SCLATER, W. L. Description of a Stag's Head allied to *Cervus dybowskii*. J. A. S. B. lviii, pp. 186-188, pl. xi.

Describes and figures a skull purchased at Darjiling, characterized by the absence of the bez tyne, which is provisionally referred to *C. dybowskii* of Ussuri-land.

Cervus maral: H. NEHRING, SB. nat. Fr. 1889, pp. 67-69, considers that the larger remains from the European Pleistocene allied to the Red Deer should be referred to this species.

† *Cervus rectus*, n. sp., E. T. NEWTON, Geol. Mag. (3) vi, p. 145, pl. v, fig. 1, Pleistocene, Norfolk.

Cervulus feæ, n. sp., O. THOMAS & E. DORIA, Ann. Mus. Genov. (2) vii, p. 92, Tenasserim.

Capreolus caprea: a popular account, with a figure, given by J. E. HARTING, Zool. (3) xiii, pp. 81-91, pl. i.

Cariacus claratus, n. sp., F. W. TRUE, P. U. S. Nat. Mus. 1888, pp. 417 & 424, Central America. [See also Zool. xiii, pp. 372-380.]

† *Cervus latus*, n. sp., F. AMEGHINO, *t. c.* (*suprà*, p. 2), p. 604, pl. xxxvii, fig. 6, Tertiary, Argentine.

† *Paraceros*, n. g., AMEGHINO, *t. c.* p. 605; type *Cervus ensedanensis*, Am.: *ibid.*

† *Paraceros vulneratus*, n. sp., AMEGHINO, *t. c.* p. 606, pl. xxxvii, fig. 5, *ibid.*

† *Epieuryceros truncus*, n. g. & sp., AMEGHINO, *t. c.* p. 613, pl. xxxviii, fig. 1.

s. TRAGULIDÆ.

† *Hypertragulus transversus*, n. sp., E. D. COPE, Am. Nat. xxiii, p. 154, White River Miocene, Canada.

†*Leptomeryx esulcatus*, n. sp., COPE, *t. c.*, *ibid.*

†*Leptomeryx semicinctus*, n. sp., COPE, *t. c.*, *ibid.*

t. CAMELIDÆ.

J. H. STEEL, J. Bomb. N. H. Soc. iv, pp. 207–212, has general notes on the Camel.

†*Auchenia cordubensis*, n. sp., F. AMEGHINO, *t. c.* (*suprà*, p. 2). p. 384, Tertiary, Argentine.

†*Auchenia ensedanensis*, n. sp., AMEGHINO, *t. c.* p. 585, *ibid.*

†*Auchenia lujanensis*, n. sp., AMEGHINO, *t. c.* p. 586, *ibid.*

†*Auchenia mesolithica*, n. sp., AMEGHINO, *t. c.* p. 588, pls. xxxvi & xxxvii, *ibid.*

†*Palæolama mesolithica*, n. sp., AMEGHINO, *t. c.* p. 920, *ibid.*

†*Palæolama leptognatha*, n. sp., AMEGHINO, *t. c.* p. 590, pl. xxxvi, fig. 1. *ibid.*

†*Stilauchenia*, n. g., AMEGHINO, *t. c.* p. 591; type *Palæolama orevi*. Gervais & Ameghino.

†*Eulamops*, n. g., AMEGHINO, *t. c.* p. 594; type *Auchenia parvella*. Ameghino.

u. COTYLOPIDÆ.

The above family name is proposed by B. LYDEKKER, in Nicholson & Lydekker's "Manual of Palæontology," 3rd ed., vol. ii, p. 1328, to replace *Oreodontide*, the name *Oreodon*, Leidy, being preoccupied by *Oreiza*. Similarly *Cotylops*, Leidy, is to replace *Oreodon*.

†*Diplothemus agrestis*, n. g. & sp., F. AMEGHINO, *t. c.* (*suprà*, p. 2). p. 577, pl. xxxiv, fig. 16, Tertiary, Argentine.

v. ANTHRACOTHERIIDÆ.

ZIENO, A. Anthracoterio di Monteviale. Mem. Ist. Venet. xxiii 1888.

Describes remains of *Anthracotherium* from the Miocene of Zovencedo and Monteviale, Italy, some of which are referred to a new species. It is stated that this species has four lower molars. In a notice in Verh. geol. Reichsanst. 1889, pp. 265 & 266, Teller suggests that this fourth molar is due to incorrect restoration, but this is denied by the author on p. 296 of the same volume.

FILHOL, H. Observations relatives a la Dentition Inférieure de l'*Anthracotherium minimum*. Bull. Soc. Philom. (8) i, pp. 51–53, woodcut and De la Dentition de Lait Inférieure de l'*A. minimum*, *t. c.* pp. 54–56.

Describes and figures mandibular rami of this species, showing the permanent and milk-dentition.

†*Anthracotherium monvialeense*, n. sp., A. ZIENO, *l. c.* Miocene, Monteviale, Italy.

w. SUIDÆ + DICOTYLIDÆ.

KITTL, E. Reste von *Listriodon* aus dem Miocän Niederösterreichs. Beitr. Pal. Oesterr.-Ung. vii, pp. 233-249, pls. xiv & xv.

Describes and figures some unusually well-preserved remains of *Listriodon splendens* from the Miocene of Lower Austria, which demonstrate the close alliance of this form to the existing *Suidæ*.

LEIDY, J. On *Platygonus*, an extinct genus allied to the Peccaries. Tr. Wagner Inst. ii, pp. 41-50, pl. vii, fig. 1.

Discusses the relations of the Pleistocene North American Peccaries described as *Platygonus* to the existing forms, with figure of a skull.

NEHRING, A. Ueber *Sus celebensis* und Verwandte. Abh. Mus. Dresden, No. 2, 34 pp., 2 pls., and woodcuts.

Concludes that *S. celebensis* is a distinct and well-marked species, allied to *S. verrucosus*, *S. longirostris*, and *S. barbatus*. This group is distinguished from all other forms by external characters, and the structure of the skull, as well as by peculiarities in the dentition. *S. celebensis* is also found in the Philippines and Moluccas.

Sus leucomystax, n. var. *continentalis*, A. NEHRING, SB. nat. Fr. 1889, p. 141, Wladiwostock, S. E. Siberia.

Dicotyles angulatus, n. sp., E. D. COPE, Am. Nat. xxiii, p. 147, S. Brazil.

x. HIPPOPOTAMIDÆ.

Hippopotamus amphibius, A. SEEFELD, Zool. Gart. xxx, p. 161, has notes on the specimens in the Zoological Gardens, St. Petersburg, with an account of the birth of a young one. K. MÖBIUS, SB. nat. Fr. 1889 p. 113, describes an abnormal lower canine.

VIII. TILLODONTIA.

†*Phanotherus marginatus*, n. g. & sp., F. AMEGHINO, t. c. (*suprà*, p. 2), p. 900, pl. lxxii, fig. 17, Tertiary, Argentine.

INCERTÆ SEDIS.

†*Astrapotherium ephelicum*, n. sp., F. AMEGHINO, t. c. (*suprà*, p. 2), p. 920, Tertiary, Argentine.

7. SIRENIA.

CLARK, J. W. On the Skeleton of *Rhytina gigas* lately acquired for the Museum of Zoology and Comparative Anatomy, with some account of the history and extinction of the animal. P. Cambr. Phil. Soc. vi, pp. 340-342.

A recapitulation of the history of the destruction of this animal, with some observations on Steller's measurements.

LEFÈVRE, T. Note préliminaire sur les Restes de Siréniens recueillis en Belgique. *Anat. Anz.* xii, pp. 197-200.

Describes two skeletons from the Belgian Oligocene referred to *Metaxytherium guettardi* and *Halitherium shinzi*. *Manatherium delheidi* is believed to be a synonym of the latter. Both skeletons show complete epiphyses to the vertebræ.

TURNER, W. [SIR]. On the Placentation of *Halicore Dugong*. *Tr. R. Soc. Edinb.* xxxv, pp. 641-666, pls. i-iii. See also *P. R. Soc. Edinb.* xvi, pp. 264 & 265 [abstract].

The dissection of a foetus and foetal membranes shows that the placenta is zonary, but either entirely or in great part non-deciduate. The bearing of this fact on the affinities of the *Sirenia* is then discussed.

MANATIDÆ.

Manatus americanus: A. ZIPPERLEN, *Zool. Gart.* xxx, pp. 25 & 26, has notes on a living specimen at Cincinnati.

8. CETACEA.

BRUSINA, S. Sisavci Jadranskoga Mora, etc. (*Die Säugethiere der Adria—Beitrag für die Proatische Fauna, mit besonder Berücksichtigung der Fauna des Mittelmeeres.*) *Rad. jugoslav. akad.* xcv, pp. 79-178, pl. i.

A memoir in Hungarian containing descriptive and historical notices of the Cetaceans found in these seas, with a figure of *Grampus griseus*. *Monachus albiventris* is also mentioned.

LEBOUCQ, H. Recherches sur la Morphologie de la Main chez les Mammifères Marins, Pinnipèdes, Siréniens, Cétacés. *Arch. Biol.* ix, pp. 571-648, pls. xxxvi-xli.

A full account of the author's observations on the subject, of which an abstract appeared in the paper quoted in *Zool. Rec.* xxv, *Mamm.* p. 53. Figures of the bones of the feet of several genera are given.

— Ueber Nagelrudimente an der Fötalen Flosse der Cetaceen und Sirenier. *Anat. Anz.* iv, pp. 190-192, woodcuts.

Finds traces of nails in the foetus of *Delphinus* and *Globicephalus*, and also in *Halicore*.

KÜKENTHAL, W. Vergleichenden - Anatomische und Entwicklungsgeschichtliche Untersuchungen an Walthieren. Pt. 1. *Denk. Ges. Jena*, iii, pt. i, pp. 1-200, pls. i-xiii.

This elaborate and finely illustrated memoir comprises the first instalment of the entire work. The first chapter treats of the dermal structures of the *Cetacea*; the second of the pectoral limb; and the third (in which the author has been assisted by Dr. T. Ziehen) of the central nervous system. The presence of hairs during foetal life or in the region

of the lips is regarded as conclusive proof that the *Celucea* are derived from Mammals clothed with hair. The conclusions as to the relationship of the Cetacean manus are the same as those previously published by the author [see Zool. Rec. xxv, *Mamm.* p. 55]. The chapter devoted to the nervous system is illustrated with beautiful plates of the brain of *Hyperödon* and *Delphinapterus* (*Beluga*); while figures of the brain of *Phoca* are given for comparison.

VAN BENEDEN, P. J. *Histoire Naturelle des Cétacés des Mers d'Europe*. Brussels: 664 pp.

The work, which is a reprint from the author's memoir in the *Mém. Cour. Ac. Belg.* 8vo, treats systematically of all the species known to inhabit any of the seas by which Europe is surrounded; and under each specific heading the synonymy, literature, habits, structure, and distribution are recorded. Noticed in *Nature*, xli, p. 223.

I. MYSTACOCETI.

a. BALENIDÆ.

GERVAIS, H. P. Sur une Nouvelle Espèce de Mégaptère (*Megaptera indica*) provenant du Golfe Persique. *N. Arch. Mus.* (2) x, pp. 199-218, pls. xviii-xx (1888).

STRUTHERS, J. Memoir on the Anatomy of the Humpback Whale (*Megaptera longimana*). Edinburgh: 8vo, 190 pp., 6 pls.

A reprint of the author's papers on this Whale published in the *J. Anat. Phys.* Reviewed in *Nature*, xl, p. 592.

VAN BENEDEN, P. J. *Histoire Naturelle des Balénoptères*. *Mém. Cour. Ac. Belg.* 8vo, xli, art. 1, 145 pp., woodcuts (1888).

Balænoptera musculus: K. MÖBIUS, *SB. nat. Fr.* 1889, pp. 97 & 98, records a male example, stranded in January on the coast of Jutland.

Balænoptera musculus: H. BEAUREGARD notices a female, stranded on the French coast at Montalivet-les-Bains (Médoc).

Megaptera indica, n. sp., H. P. GÉRAIS, *l. c.*

II. ODONTOCETI.

TURNER, W. [SIR]. Additional Observations on the Stomach in the Ziphioid and Delphinoid Whales. *J. Anat. Phys.* xxiii, pp. 466-492, woodcuts.

This paper describes the results of the dissection of the viscera of the following forms, viz.: *Mesoplodon bidens*, *Hyperödon rostratus*, *Phocæna communis*, *Delphinus delphis*, *Lagenorhynchus albirostris*, *Monodon monoceros*, and *Delphinapterus leucas*.

b. PHYSETERIDÆ.

POUCHET, G., & BEAUREGARD, H. Sur l'Estomac du Cachalot. *C.R. Soc. Biol.* (9) i, pp. 92-94.

Describes the structure of the stomach of the Sperm-Whale.

[POUCHET, G., & BEAUREGARD, H.] Note sur le Squelette du Cachalot Femelle. *T. c.* pp. 201-204.

Compares the characters of the skeleton of the female Sperm-Whale with that of the male.

— & —. Note sur un Tête de Jeune Cachalot. *T. c.* pp. 553-555.

Describes the external characters of the head of a young male Sperm-Whale, with brief notes on its dissection.

— & —. Recherches sur le Cachalot. *N. Arch. Mus.* (3) i. pp. 1-96, pls. i-viii.

SCOTT, J. H., & PARKER, T. J. On a specimen of *Ziphius* recently obtained near Dunedin. *Tr. Z. S.* xii, pp. 241-248, pls. xlviii-l.

Describes the external characters and anatomy of a Ziphioid Whale, with figures of the external form, and portions of the soft parts and skeleton.

VAN BENEDEN, P. J. Les Ziphioides des Mers d'Europe. *Mém. Cour. Ac. Belg.* 8vo, xli, art. 2, 119 pp., woodcuts (1888).

Hyperoodon rostratus: SIR W. TURNER, P. *Phys. Soc. Edinb.* x. pp. 19-23, has notes on the skull of an aged male from Shetland.

Mesoplodon (Micropteron) bidens: SIR W. TURNER, *t. c.* pp. 5-13, describes a specimen stranded in the Firth of Forth, with figure of the head.

c. DELPHINIDÆ.

LÜTKEN, C. F. Spolia Atlantica.—Bidrag til Kundskab om de tre pelsigiske Tandhval-Slægter *Steno*, *Delphinus*, og *Prodelphinus*. *Dan. Selsk. Skr.* (6) v, pt. 1, 61 pp., 2 pls., woodcuts.

A description of the various species of the three genera mentioned, with woodcuts of skulls, limbs, and external form. The external form and skeleton of *Steno rostratus* is illustrated in the first plate.

NEVIANI, A. Avanzi di un *Tursiops* fossile rinvenuti presso Caraffa in provincia di Catanzaro. *Riv. Ital. Sci. Nat.* ix, pp. 4-6.

Records remains of a species of *Tursiops* from the Italian Pliocene.

TRUE, F. W. Contributions to the Natural History of the Cetaceans. a Review of the Family *Delphinidae*. *Bull. U. S. Nat. Mus.* No. 36. 192 pp., 47 pls.

In this elaborate memoir the author accepts in the main the generic divisions of the *Delphinidae* adopted by Flower, and devotes his attention mainly to the question of the number of species. All the known genera, with the exception of *Orca* and *Orcella*, are discussed, and small-sized figures are given of the external contour and skulls of a large number of species. In the synopsis descriptions are given of the genera, and also of the better known species. Altogether, 19 genera are recognized, but the number of valid species is in many cases left uncertain. One new species of *Cephalorhynchus* is described (*vide infra*).

Lagenorhynchus albirostis: SIR W. TURNER, P. *Phys. Soc. Edinb.* x. pp. 14-19, has notes on specimens killed off the Scottish coasts, with a figure of the head. H. LAVER, *Tr. Ess. Club*, iii, pp. 169 & 170, records a specimen caught in the Colne.

Tursiops tursio; a record of two specimens captured in the Humber given by J. CORDEAUX, Naturalist, 1889, p. 6.

Cephalorhynchus albifrons, n. sp., F. W. TRUE, *op. cit.* p. 111, New Zealand. Figured in 1873 by HECTOR as *Electra clancula*.

d. SQUALODONTIDÆ.

†*Squalodon quaternarium*, n. sp., C. J. FORSYTH-MAJOR, P.-v. Soc. Tosc. ii, p. 227 (1881), Cavern-deposits, Montetignosa, near Leghorn. [Omitted from Zool. Rec. xviii.]

9. EDENTATA.

COPE, E. D. The *Edentata* of North America. Am. Nat. xxiii, pp. 657-664, pls. xxxi & xxxii.

The author proposes to adopt the division of the *Edentata* into the *Nomarthra* and *Xenarthra*, according to Gill's arrangement; the former comprising the *Manidæ* and *Orycteropodidæ*, and the latter the remaining forms. Distinctive characters of the various genera are given. The name *Ocnobates* is proposed to replace the preoccupied *Oracanthus*; while *Nothropus* is referred to the *Glyptodontidæ* instead of the *Bradypodidæ*. The skull of *Megalonyx* and the dermal scales of *Cariodermis* are figured. [See *Megatheriidæ*.]

a. MANIDÆ.

Manis hessi, n. sp., T. NOACK, Zool. Jahrb. iv, p. 100, pl. i, Banana, S. Africa.

b. MYRMECOPHAGIDÆ.

Myrmecophaga (bivittata) straminea, n. sp., E. D. COPE, Am. Nat. xxiii, p. 132, S. Brazil.

Myrmecophaga sellata, n. sp., COPE, *l. c.* p. 133, Honduras.

c. BRADYPODIDÆ.

SEITZ, —. Zur Lebensgeschichte der Faultiere. Zool. Gart. xxx, pp. 271-274.

Notes on the history and habits of Sloths.

d. MEGATHERIIDÆ.

†*Nothrotherium*, n. n., R. LYDEKKER, in Nicholson & Lydekker's Manual of Palæontology, 3rd ed. vol. ii, p. 1299, to replace *Cælodon*, Lund, preoccupied.

†*Ocnobates*, n. n., E. D. COPE, Am. Nat. xxiii, p. 659, to replace *Oracanthus*, Ameghino. preoccupied.

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†*Neoracanthus*, n. n., T. AMEGHINO, t. c. (*suprà*, p. 2), p. 673, to replace *Oracanthus*.

†*Neoracanthus brackebuschianus*, n. sp., AMEGHINO, t. c. p. 676, pl. xl, fig. 19, Tertiary, Argentine.

†*Zamicrus admirabilis*, n. g. & sp., AMEGHINO, t. c. p. 682, pl. xli, fig. 7, *ibid*.

†*Lestodon parunensis*, n. sp., AMEGHINO, t. c. p. 715, pl. xl, fig. 12, *ibid*.

†*Pseudolestodon injunctus*, n. sp., AMEGHINO, t. c. p. 753, pl. xl, *ibid*.

e. DASYPODIDÆ.

†*Dasypus platensis*, n. sp., F. AMEGHINO, t. c. (*suprà*, p. 2), p. 866, pl. lxviii, figs. 40–42, Tertiary, Argentine.

†*Dasypus hesternus*, n. sp., AMEGHINO, t. c. p. 922, pl. lxxxi, figs. 11–14, *ibid*.

Zaedyx, n. g., AMEGHINO, t. c. p. 867; type, *Dasypus minutus*, Desm.

†*Dasypotherium australe*, n. g. & sp., F. P. MORENO, Bol. Mus. La Plata, 1889, p. 38, Tertiary, Argentine.

Tatusia megalolepis, n. sp., E. D. COPE, Am. Nat. xxiii, p. 134, S. Brazil.

†*Chlamydotherium humboldti* recorded by J. LEIDY (*suprà*, p. 9), from Florida.

f. GLYPTODONTIDÆ.

†*Glyptodon damesi*, n. sp., S. ROTH, Z. geol. Ges. 1888, p. 390, Tertiary, Argentine. [Omitted from Zool. Rec. xxv.]

†*Glyptodon petaliferus* recorded by J. LEIDY (*suprà*, p. 9), from Florida.

†*Glyptodon septentrionalis*, n. sp., J. LEIDY, P. Ac. Philad. 1889, p. 97, Tertiary, Florida; subsequently identified with *Chlamydotherium humboldti*, in Tr. Wagner Inst. ii, p. 25.

†*Glyptodon falkneri*, n. sp., F. AMEGHINO, t. c. (*suprà*, p. 2), p. 788, pls. i & liii, Tertiary, Argentine.

†*Glyptodon fiorinii*, n. sp., AMEGHINO, t. c. p. 789, pl. lxxv, fig. 3, *ibid*.

†*Neothoracophorus*, n. n., AMEGHINO, t. c. p. 790, to replace *Thoracophorus*, preoccupied.

†*Cochlops muricatus*, n. g. & sp., AMEGHINO, t. c. p. 792, pls. i & liii, *ibid*.

†*Palæhoplophorus disjunctus*, n. sp., AMEGHINO, t. c. p. 802, pl. lv, fig. 6, *ibid*.

†*Hoplophorus pseudornatus*, n. sp., AMEGHINO, t. c. p. 808, pl. lviii, fig. 5, *ibid*.

†*Hoplophorus evidens*, n. sp., AMEGHINO, t. c. p. 811, pl. lxxv, fig. 2, *ibid*.

†*Hoplophorus verus*, n. sp., AMEGHINO, t. c. p. 814, pl. lxix, fig. 15, *ibid*.

†*Hoplophorus lydekkeri*, n. sp., AMEGHINO, t. c. p. 814, pl. lxxxiv, fig. 8, *ibid*.

†*Hoplophorus bergi*, n. sp., AMEGHINO, t. c. p. 815, pl. xl, figs. 1–3, *ibid*.

†*Hoplophorus heusseri*, n. sp., AMEGHINO, t. c. p. 816, pl. lxxxvi, figs. 1–3, *ibid*.

†*Hoplophorus clarasianus*, n. sp., AMEGHINO, *t. c.* p. 817, pl. lxxxiv, fig. 5, *ibid.*

†*Hoplophorus migoyianus*, n. sp., AMEGHINO, *t. c.* p. 818, pl. lxxxix, figs. 1-3, *ibid.*

†*Lomaphorus*, n. g., AMEGHINO, *t. c.* p. 819; type *Hoplophorus imperfectus*, Gerv. & Am., *ibid.*

†*Lomaphorus cingulatus*, n. sp., AMEGHINO, *t. c.* p. 821, pl. lvi, fig. 5, *ibid.*

†*Asterostemma depressa*, n. g. & sp., AMEGHINO, *t. c.* pp. 822 & 823, pl. lxiv, fig. 2, *ibid.*

†*Asterostemma granata*, n. sp., AMEGHINO, *t. c.* p. 823, pl. lxiv, fig. 3, *ibid.*

†*Asterostemma laevata*, n. sp., AMEGHINO, *t. c.* p. 823, pl. lxiv, fig. 6, *ibid.*

†*Prohophorus orientalis*, n. sp., AMEGHINO, *t. c.* p. 827, pl. xci, fig. 2, *ibid.*

†*Zaphilus larranagai*, n. g. & sp., AMEGHINO, *t. c.* p. 828, pl. lxxxiii, figs. 1 & 2, *ibid.*

†*Panochthus penzelianus*, n. sp., AMEGHINO, *t. c.* p. 835, pl. lix, figs. 1-4, *ibid.*

†*Panochthus voghti*, n. sp., AMEGHINO, *t. c.* p. 836, pl. lvii, fig. 2, *ibid.*

†*Panochthus nodotianus*, n. sp., AMEGHINO, *t. c.* p. 837, pl. lviii, fig. 4, *ibid.*

†*Neuryurus*, n. n., AMEGHINO, *t. c.* p. 840, to replace *Euryurus*, preoccupied, *ibid.*

†*Dedicurus kokenianus*, n. sp., AMEGHINO, *t. c.* p. 849, pl. lvi, figs. 1 & 2, *ibid.*

†*Pseudoeuryurus lelongianus*, n. g. & sp., AMEGHINO, *t. c.* pp. 851 & 852, pl. lxxv, fig. 7, *ibid.*

INCERTÆ SEDIS.

†*Delotherium venerandum*, n. sp., F. AMEGHINO, *t. c.* (*suprà*, p. 2), p. 666, pl. xl, fig. 22, Tertiary, Argentine.

10. MARSUPIALIA.

I. DIPROTODONTIA.

a. NOTOTHERIIDÆ.

LYDEKKER, B. *Nototherium* and *Zygomaturus*. Ann. N. H. (6) iii, pp. 149-152, and iv, p. 261.

Disputes the contention of De Vis [Zool. Rec. xxv, *Mamm.* p. 61, *et infra*], that the skulls to which these names have been applied are generically distinct from one another.

DE VIS, C. W. On the genera *Nototherium* and *Zygomaturus*. *Op. cit.* (6) iv, pp. 257-261.

Controverts the opinion advanced in the preceding note, and maintains the distinctness of the forms named. A reply by R. Lydekker on p. 261 of same volume.

b. PHALANGERIDÆ.

DE VIS, C. W. On the *Phalangistidæ* of the Post-Tertiary Period in Queensland. P. R. Soc. Queensl. vi, pp. 105-114, pl. v.

Describes and figures various remains from the Pleistocene of Queensland, which are regarded as indicating large forms allied to the existing representatives of the *Phalangeridæ*. These forms include *Koalemus*, allied to *Phascolarctus*; *Archizonurus*, approximating to *Pseudochirus* (*Phalungista*) *archeri*; a large species of *Cuscus* [= *Phalanger*]; a large *Pseudochirus*; while it is suggested that a molar may belong to *Phalangista* [= *Trichosurus*] (*vide infra*).

†*Koalemus ingens*, n. g. & sp., C. W. DE VIS, *t. c.* p. 106, pl. v, Pleistocene, Queensland.

†*Archizonurus securus*, n. g. & sp., DE VIS, *t. c.* p. 109, pl. v, *ibid.*

†*Cuscus procuscus*, n. sp., DE VIS, *t. c.* p. 111, pl. v, *ibid.*

†*Pseudochirus* (?) *notabilis*, n. sp., DE VIS, p. 113, pl. v, *ibid.*

c. MACROPODIDÆ.

STIRLING, E. C. On some Points in the Anatomy of the Female Organs of Generation in the Kangaroo, especially in relation to the acts of Impregnation and Parturition. P. Z. S. 1889, pp. 433-440, woodcuts.

It is shown that in *Macropus major* the semen passes by the lateral canals, while in *M. (Ophranter) erubescens* the embryo passes out by the median canal; but it is suggested that this may not hold good for all the family.

Macropus rufus: E. PINKERT, Zool. Gart. xxx, pp. 85 & 86, describes the birth of the young.

†*Synaptodus ævorum*, n. g. & sp., C. W. DE VIS, P. R. Soc. Queensl. v, pp. 158-160, pl. vii, Pleistocene, Queensland.

II. POLYPROTODONTIA.

d. DASYURIDÆ.

LECHE, W. Ueber Hornzähne bei einem Säugetiere. Anat. Anz. iv, pp. 499-501.

Describes and figures certain horny structures found on the palate of *Myrmecobius*, which are regarded as horny teeth.

e. PERAMELIDÆ.

TUCKERMANN, F. An undescribed Taste-area in *Perameles nasuta*. Anat. Anz. iv, pp. 411 & 412, woodcut.

Describes and figures lateral gustatory organs in *Perameles* which had been previously overlooked.

f. DIDELPHYIDÆ.

†*Didelphys lujanensis*, n. sp., F. AMEGHINO, t. c. (*suprà*, p. 2), p. 279, pl. i, fig. 1, Tertiary, Argentine.

†*Didelphys triforata*, n. sp., AMEGHINO, t. c. p. 280, pl. xii, fig. 37, *ibid.*

†*Didelphys juga*, n. sp., AMEGHINO, t. c. p. 281, pl. i, fig. 3, *ibid.*

†*Didelphys grandæva*, n. sp., AMEGHINO, t. c. p. 281, pl. i, fig. 4, *ibid.*

†*Dimerodon mutilatus*, n. g. & sp., AMEGHINO, t. c. pp. 282 & 283, pl. i, fig. 5, *ibid.*

g. AMPHITHERIIDÆ.

†*Dryolestes tenax*, n. sp., O. C. MARSH, Am. J. Sci. (3) xxxviii, p. 87, Cretaceous, Wyoming.

†*Didelphops rorax*, n. g. & sp., MARSH, t. c. p. 88, pl. iv, figs. 1-3, *ibid.* [The generic name of this and the two following species was given as *Didelphodon*, but, on account of preoccupation, was emended in an erratum.]

†*Didelphops ferox*, n. sp., MARSH, t. c. p. 88, pl. iv, fig. 4, *ibid.*

†*Didelphops comptus*, n. sp., MARSH, t. c. p. 88, pl. iv, figs. 5-7, *ibid.*

†*Cimolestes incisus*, n. g. & sp., MARSH, t. c. p. 89, pl. iv, figs. 12-14, *ibid.*

†*Cimolestes curtus*, n. sp., MARSH, t. c. p. 89, pl. iv, figs. 8-11, *ibid.*

†*Pediomys elegans*, n. g. & sp., MARSH, t. c. p. 89, pl. iv, figs. 23-25, *ibid.*

II. MULTITUBERCULATA.

†*Cimolomys gracilis*, n. g. & sp., O. C. MARSH, Am. J. Sci. (3) xxxviii, p. 84, pl. ii, figs. 1-4, Cretaceous, Wyoming.

†*Cimolomys bellus*, n. sp., MARSH, t. c. p. 84, *ibid.*

†*Cimolomys digona*, n. sp., MARSH, t. c. p. 177, pl. vii, figs. 1-4, *ibid.*

†*Cimolodon nitidus*, n. g. & sp., MARSH, t. c. p. 84, pl. ii, figs. 5-8, *ibid.*

†*Nanomys minutus*, n. g. & sp., MARSH, t. c. p. 85, pl. ii, figs. 9-12, *ibid.* [Name preoccupied.—R. L.]

†*Dipriodon robustus*, n. g. & sp., MARSH, t. c. p. 85, pl. ii, figs. 13-15, *ibid.*

†*Tripriodon cælatus*, n. g. & sp., MARSH, t. c. p. 86, pl. ii, figs. 19 & 20, *ibid.*

†*Tripriodon caperatus*, n. sp., MARSH, t. c. p. 86, pl. ii, figs. 18-21, *ibid.*

†*Selenacodon fragilis*, n. g. & sp., MARSH, t. c. p. 86, pl. ii, figs. 22-24, *ibid.*

†*Selenacodon brevis*, n. sp., MARSH, t. c. p. 177, pl. vii, figs. 9-12, *ibid.*

†*Halodon sculptus*, n. g. & sp., MARSH, t. c. p. 87, pl. iii, figs. 11-13, *ibid.*

†*Halodon formosus*, n. sp., MARSH, t. c. p. 179, pl. viii, figs. 36-38, *ibid.*

†*Camptomus amplus*, n. g. & sp., MARSH, t. c. p. 87, pl. v, figs. 1 & 2, *ibid.*

†*Stagodon nitor*, n. g. & sp., MARSH, t. c. p. 178, pl. vii, figs. 22-25, *ibid.*

†*Stagodon tumidus*, n. sp., MARSH, t. c. p. 178, pl. vii, figs. 17-21, *ibid.*

†*Plutacodon nanus*, n. g. & sp., MARSH, t. c. p. 178, pl. viii, figs. 4-12, *ibid.*

†*Oracodon anceps*, n. g. & sp., MARSH, t. c. p. 178, pl. viii, figs. 13-15, *ibid.*

†*Allacodon latus*, n. g. & sp., MARSH, t. c. p. 178, pl. viii, figs. 22-26, *ibid.*

†*Allacodon pumilus*, n. sp., MARSH, t. c. p. 179, *ibid.*

†*Epanorthus*, n. n., F. AMEGHINO, t. c. (*suprà*, p. 2), p. 271, to replace *Palaœthentes*, preoccupied.

12. MONOTREMATA.

WALKER, MARY L. On the Larynx and Hyoid of *Monotremata*. *Stud. Mus. Dundee*, i, No. 3.

Records the presence of an intraaurial epiglottis in *Echidna*.

a. ORNITHORHYNCHIDÆ.

THOMAS, O. On the Dentition of *Ornithorhynchus*. *P. R. Soc.* xli, pp. 126-131, pl. ii.

The author described specimens about one-third grown which showed teeth, and deduced the following conclusions:—The teeth are functional for a considerable part of the animal's life, cutting the gum as usual, and, after being worn down by friction with food and sand, are shed from the mouth as are the milk-teeth of other Mammals. The cornules are certainly developed from the buccal epithelium, but from that under and around instead of over the teeth, and the hollows in the plates are the vestiges of the original alveoli of the teeth, from out of which the latter have been shed.

b. ECHIDNIDÆ.

WESTLING, C. Anatomische Untersuchungen ueber *Echidna*. Bih. Sv.

Ak. Handl. xv, pt. iv, No. 3, pp. 1-71, pls. i-vi.

A detailed account of the anatomy of *Echidna*. The author concludes that *Echidna* and *Ornithorhynchus* should be regarded as nearly allied types, the difference between them being mainly of a secondary nature. The great development of the mammary organ in the male is especially noted.

INCERTÆ ORDINIS.

†*Macropristis*, n. g., F. AMEGHINO, *t. c.* (*suprà*, p. 2), p. 267, Tertiary, Argentine; type, *Mesotherium marshi*, Moreno.

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A V E S.

BY

A. H. EVANS, M.A., F.Z.S.

THOUGH no one book of the year 1889 stands out pre-eminently from its fellows, as did that of Fürbringer in 1888, a glance at the chief publications shews, as might be expected, that a fresh impetus has been given to the study of morphology and its daughter science taxonomy. In the different groups of the class *Aves* we find important articles by SHUFELDT, GADOW, LUCAS, and SEEBOHM; of whom the first not only continues his osteological investigations among the Arctic and Subarctic Water Birds, but extends them to the Herons, Hawks, Picarian and Passerine Birds, while the second turns his attention to the arrangement of the intestines, in search of a possible clue to the affinities existing between families or genera. In the first volume of the Birds of India, OATES propounds a novel and somewhat artificial classification of *Passeres*, to the substance of which SHARPE assents, in a review which may be unearthed from the columns of 'The Field' newspaper; while COPE, in the 'American Naturalist,' suggests some minor alterations in the system proposed by Stejneger in the 'Standard Natural History' of 1885.

In new works of the highest calibre the year may strike the reader as decidedly weak, but we may mention as most useful WATERHOUSE's 'Index Generum Avium' and the abridged edition of the American Ornithologists' Union Check-List, with the Supplement to the original issue; nor must we omit the two large works on Russian Birds by PLESKE, while E. W. OATES edits a second edition of Hume's 'Nests and Eggs of Indian Birds,' and RAMSAY supervises a work by ETHERIDGE, NORTH, and others on Lord Howe Island.

J. A. MURRAY has been issuing, since 1887, an Avifauna of British India, which has now reached our libraries; and many well-known books have reached a further stage, such as BARTLETT's Monograph of the *Ploceidæ* and *Fringillidæ*, GADOW's continuation of *Aves* in Broun's 'Klassen und Ordnungen des Thier-reichs,' GIGLIOLI & MANZELLA's 'Iconografia dell' Avifauna Italica,' GODMAN & SALVIN's 'Biologia Centrali-Americana,' MENZBIER's 'Ornithologie du Turkestan,' MEYER's

'Abbildungen von Vogel-Skeletten,' LORD LILFORD'S 'Coloured Figures of the Birds of the British Islands,' and SHARPE & WYATT'S 'Monograph of the *Hirundinidae*.'

In periodical literature, progress in different lines is made by FANNY BIGNON, CAMPBELL, DE VIS, HARGITT, and STEJNEGER; while a somewhat new departure is taken by BRANDT & AITCHISON.

The chief works published during the past year, as far as they relate to GEOGRAPHICAL AREAS, may be found under the names below; while reference should also be made to BARTLETT, BEDDARD, BERLEPSCH, COPE, GADOW, GURNEY, FÜRBRINGER, HARGITT, MARSHALL, A. NEWTON, F. NICHOLSON, H. A. NICHOLSON & LYDEKKER, RIDGWAY, [PRINCE] RUDOLF, SALVADORI & GIGLIOLI, SCLATER, SEEBOHM, SHARPE, SHUFELDT, SIMON, TRISTRAM, TSCHUSI, WATERHOUSE, WILSON.

PALEARCTIC REGION: Aitchison & Sharpe (Afghanistan). Aplin (Britain), Bielz (Austria), Blasius (Japan), Browne, Brusina (Servia). A. Chapman (Britain), Clarke (Pyrenees), Cordeaux (Britain). Dalla-Torre (Heligoland), Dresser (Transcaspia), Fatio & Studer (Switzerland), Giglioli (Italy), Guillemard (Cyprus), Hagerup (Greenland), Harting (Britain), Hartwig (North Cape), Keller (Austria), Khlyebnikov (Russia), Llford (Cyprus, Britain), H. A. Macpherson (Britain), Maugéard (France), Matschie (Germany), Meade-Waldo (Canary Is.), Meuzbier (Turkestan), Meyer & Helm (Germany), Mojsisovics (Hungary), Muirhead (Britain), Nikolski (Saghalin I.), Olphe-Galliard (W. Europe), Palmén (Finland), Pemrov, Pleske (Russia), Radde & Walter (Transcaspia), Reichenow (Germany), Riesenthal, Rudolf (Mid-Europe), St. John (Afghanistan), Saunders (Britain), Savatier (France), Schier (Bohemia), Schwappach (Germany), Stejneger (Japan), Stolzmun (Ashkhabad), Sundström (Sweden), Tristram (Canary Is.), Tschusi & Dalla-Torre (Austria-Hungary), Zarouduoi (Transcaspia).

ETHIOPIAN: Bocage (W. Africa), Büttikofer (S.W. Africa and Liberia), Hartlaub (Centr. Africa), Milne-Edwards & Oustalet (Comoro Is.), Reichenow, Shelley (E. Africa), Sousa (Angola), Tristram (Centr. Africa).

INDIAN: Barnes (India), Everett (Paliwan), Hartert (Indo-Malay region), Hickson (Celebes), Koorders (Carimon-Java Is.), Murray, E. W. Oates (India), Salvadori (Burma, Papuasias, and Molucca), Sharpe (Borneo, Afghanistan), Styan (China), Vorderman (Carimon-Java Is.).

AUSTRALIAN: Campbell, Cox & Hamilton, De Vis (Australia), Etheridge & Ramsay (Lord Howe I.), Kirk (New Zealand), Lutholtz (Queensland), North (Lord Howe I.), Ogilvie-Grant (Pacific), Reischek (New Zealand), Saville-Kent (Port Darwin), Thomson, Tristram (Louisiane and d'Entrecasteaux Is.).

NEARCTIC: Barrows, Bendire, Brewster (U.S.), Dionne (Canada), Evermann, Faxon, Goss, Hasbrouck (U.S.), W. A. Jeffries, Lawrence, Merriam, Pindar, Scott, Shufeldt, Stone (U.S.).

NEOTROPICAL: Allen (Ecuador & Bolivia), Berlepsch (Brazil & Peru), Cory (West Indies), Dalgleish (Paraguay), Feilden (West

Indies), Godman & Salvin (Centr. America), Leverkühn (S. America), Quelch (Brit. Guiana), Ridgway (Costa Rica, St. Lucia, Galapagos Is.), Salvin (Yucatan), Salvin & Godman (Mexico), Selater (Dominica, St. Lucia), Selater & Hudson (Argentine Republic), Young (Brit. Guiana).

For anatomical, morphological, physiological, and pathological papers, see: Aduccio, Alix, Arrigoni del Oddi, Bancroft, Basedow, Beddard, Bignon, Bizzozero, Bonjour, Brandt, G. W. Butler, Camerano, Cowper, Cuccati, Davies, Gadow, Gallerani, Hennicke, Hepburn, Jegorow, Lavocat, Maffucci, Marage, Marcacci, Masius, Meinert, Merlato, Mills, Peck, Petrone, Pilliet, Putelli, Ramón y Cajal, Ranvier, Reid, Retterer, Richter, Roché, Seebohm, Shore, Sibley, Smirnov, Sutton, Virchow, Wickmann, Ziegler.

For extinct species, see E. T. Newton, C. W. De Vis,; for colour as a protection to eggs, A. H. S. Lucas, A. H. Macpherson, Wallace, Titchener; and for flight of Birds, see under Baines, A. C.

THE GENERAL SUBJECT,

WITH TITLES OF SEPARATE WORKS AND OF THE MORE IMPORTANT PAPERS PUBLISHED IN PROCEEDINGS OF SOCIETIES, &c.

Second Report of the Committee, consisting of PROFESSOR FLOWER (Chairman), Mr. D. MORRIS (Secretary), Mr. CARRUTHERS, Dr. SELATER, Mr. THISELTON-DYER, Dr. SHARPE, Mr. F. DU CANE GODMAN, and PROFESSOR NEWTON, appointed for the purpose of reporting on the present state of our knowledge of the Zoology and Botany of the West India Islands, and taking steps to investigate ascertained deficiencies in the Fauna and Flora. Rep. Brit. Ass. 1889, pp. 93 & 94. [*Cf. Zool. Rec. xxv, Aves, p. 3.*]

Report of the Committee, consisting of PROFESSOR NEWTON, Mr. JOHN CORDEAUX (Secretary), Mr. J. A. HARVE-BROWN, Mr. R. M. BARRINGTON, Mr. W. E. CLARKE, and the Rev. E. P. KNUBLEY, appointed to make a digest of the Observations on Migration of Birds at Lighthouses and Lightvessels, which have been carried on during the past nine years by the Migration Committee of the British Association (with the consent of the Master and Elder Brethren of the Trinity House and the Commissioners of Northern and Irish Lights), and to report upon the same. *T. c. p. 114.* [*Cf. Zool. Rec. xxv, Aves, p. 3.*]

Supplement to the Code of Nomenclature and Check-List of North American Birds, adopted by the American Ornithologists' Union. Prepared by a Committee of the Union. New York: 1889, 8vo, 28 pp.

Involving about one hundred points in which alterations have been made, arranged under the heads of Additions, Eliminations, and Changes of Nomenclature. [*Cf. Zool. Rec. xxiii, Aves, p. 3.*]

Check-List of North American Birds, according to the Canons of Nomenclature of the American Ornithologists' Union. Abridged edition. Revised. New York: 1889, 8vo, 71 pp.

The list of fossil Birds is here omitted, while another of naturalized species takes its place. Only the scientific names, English names, concordance, and current numbers are left.

ADUCCO, V. Azione della luce sopra la durata della vita, la perdita in peso, la temperatura, e la quantità di glicogeno epatico e muscolare nei colombi sottoposti al digiuno. Atti (Rend.) Acc. Rom. v, pp. 684-689. [In French, Arch. Ital. Biol. xii, pp. 208-214.]

AITCHISON, J. E. T. The Zoology of the Afghan Delimitation Commission. Tr. L. S. v, pp. 53-142, pls. vi-xiv.

The Birds are mainly by R. B. SHARPE, *q. v.*

ALBARDA, H. Ornithologie van Nederland, waarnemingen in 1887. Tijdschr. Nederl. Dierk. Ver. ii, pp. 145-157. [Cf. Zool. Rec. xiv, *Aves*, p. 4.]

ALIX, E. Sur la Classification musculaire des Vertébrés. Mém. Centenaires Soc. Philomath. [1888] pp. 47-62.

The conclusions stated herein are chiefly based on former articles by the author in the same journal.

ALLEN, J. A. Notes on a Collection of Birds from Quito, Ecuador. Bull. Am. Mus. Nat. Hist. ii, pp. 69-76.

[See *Tunagridæ*, *Cotingidæ*.]

— List of the Birds collected in Bolivia by Dr. H. H. Rusby, with Field Notes by the Collector. *T. c.* pp. 77-112.

[See *Tyrannidæ*, *Pipridæ*, *Dendrocolaptidæ*, *Formicariidæ*, *Pteroptochidæ*.]

ALTUM, E. [See *Corvidæ*, *Falconidæ*.]

ANDERSON, J. C. Sporting Rambles round Simla. J. Bomb. N. H. Soc. iv, pp. 56-66.

APLIN, O. V. The Birds of Oxfordshire. Oxford: 1889, 8vo, vii & 217 pp., 1 pl.

The ornithology of this county being chiefly treated in scattered articles, the present book will be found of great use in combining our information on the subject.

— Ornithological Notes from the Norfolk Coast. Zool. 1889, pp. 9-12.

ARRIGONI DEL ODDI, E. Notizie di Caccia e Note Zoologiche. Boll. Soc. Nat. Napoli, 1889, pp. 104-107.

A list of Birds taken and a note on *Syrnhaptes paradoxus*.

— Notizie sopra un *Ligurinus chloris* (L.) ed una *Alauda arvensis* L. Anomali nel Rostro. *T. c.* pp. 260 & 261. 5 figs.

- BACKMAN, H. Anteckningar om Foglarne uti Salmis härad. Med. Soc. Fenn. xv [1886], pp. 44-50.
- BAINES, A. C. The Sailing Flight of the Albatross. *Nature*, xl [1889], pp. 9 & 10. [See CATCHPOOL, E., COURTENAY, R., FROUDE, R. E., KENT, W., MACGREGOR, J. G., OLIVER, J. E., PEALE, S. E., RAYLEIGH (LORD).].
- BAKER, F. C. Notes on the Food of Birds. P. Ac. Philad. 1889, pp. 266-270.
- BANCROFT, T. L. The Filariae [blood-parasites] of Birds. P. R. Soc. Queensl. vi [1889], pp. 58-62.
- BARNES, H. E. Nesting in Western India. J. Bomb. N. H. Soc. iv, pp. 1-21, 83-98, & 237-255, pls. i-iii. [Cf. Zool. Rec. xxv, *Aves*, p. 4.]
The plates are of eggs (1 nest), see *Hirundinidae*, *Caprimulgidae*, *Muscicapidae*, *Cuculidae*, *Pycnonotidae*.
- BARROWS, W. B., & MERRIAM, C. H. The English Sparrow (*Passer domesticus*) in North America, especially in its Relations to Agriculture. Bull. I. of Division of Economic Ornithology and Mammalogy, U.S. Dept. of Agriculture. Washington: 1889, 8vo, 405 pp., map, 1 cut.
Part I. Summaries of Evidence; Recommendations; Special Reports.
Part II. Evidence.
- BARTLETT, E. A Monograph of the Weaver-Birds, *Ploceidae*, and Arboreal and Terrestrial Finches, *Fringillidae*. Pts. III, IV, & V. Maidstone: 1889, sm. 4to, pagin. discont., 20 pls., for which see the families. [Cf. Zool. Rec. xxv, *Aves*, p. 5.]
Only nineteen plates are really issued, as that of *Cardinalis igneus* is postponed.
- BASEDOW, H. v. Die Entwicklung des Vogels im Eie erläutert an der des Hühnereies. MT. orn. Ver. Wien, 1889, pp. 105-108 & 113-115.
- BATCHELDER, C. F. [See *Picidae*.]
- BECKWITH, W. E. Notes on Shropshire Birds. Tr. Shropshire Soc. (2) i, pp. 201-216; ii, pp. 1-16. [Cf. Zool. Rec. xxv, *Aves*, p. 5.]
- BEDDARD, F. E. For very important papers on anatomy, see *Bucerotidae*, *Cariamidae*, *Falconidae*, *Opisthocomidae*; see also *Musophagidae*, *Tinamidae*.
- BELDING, L. [See *Trochilidae*.]
- BENDIRE, C. E. [See *Corvidae*, *Fringillidae*, *Striges*, *Tetraonidae*.]
- BERLEPSCH, H. v. Systematisches Verzeichniss der von Herrn Gustav Garlepp in Brasilien und Nord-Peru, im Gebiete des oberen Amazonas, gesammelten Vogelbälge. J. f. O. 1889, pp. 97-101 & 289-321, pl. iii.
The first instalment is a list of a collection made at Fonteboa and Tonantins, Province of Solimoes, N.W. Brazil; the second, of two others from the neighbourhood of the Rivers Ucayali and Huallaga, N. Peru.

In all 142 species are included. [See *Cerebidae*, *Icteridae*, *Mniotiltidae*, *Troglodytidae*, *Tyrannidae*, *Momotidae*, *Rhamphastidae*, *Psittaci*, *Ardeide*.]

[BERLEPSCH, H. v.] Notes on some Neotropical Birds belonging to the United States National Museum. P. U. S. Nat. Mus. 1888 [xi]. pp. 559-566.

Identifications of species in the above museum, referring chiefly to Humming-birds. [See *Dendrocolaptidae*, *Trochilidae*.]

— [See also *Trochilidae*, *Psittaci*.]

BERNARD, P. Note sur une forme peu commune d'anomalie de l'oeuf de poule. CR. Soc. Biol. 1889, pp. 504-507.

BIELZ, E. A. Die Fauna der Wirbelthiere Siebenbürgens nach ihrem gegenwärtigen Bestande. Verh. siebenb. Ver. xxxviii (1898), pp. 15-120.

Aves, pp. 36-106. Literature from 1856 to 1887, pp. 16-20.

BIGNON, FANNY. Contribution à l'étude de la Pneumaticité chez les Oiseaux. Les Cellules Aériennes cervico-céphaliques des Oiseaux et leurs Rapports avec les Os de la Tête. Mém. Soc. Zool. Fr. 1889 [ü]. pp. 260-320, pl. x-xiii.

Introduction, Historique, Procédés, Description de la tête des Oiseaux. Cavités du Crane et de la Face (Oreille, Orbites, Fosse pré-orbitaire, Fosses nasales, Pneumaticité des os de la Tête). Réservoirs pneumatiques cervico-céphaliques (Rapaces, Psittacides, Grimpeurs, Passereaux, Gallinacés et Pigeons, Échassiers, Coureurs, Palmipèdes), Rôle des sacs aériens cervico-céphaliques, Résumé et Conclusions.

— [See also *Cathartidae*, *Sulidae*.]

BISHOP, L. B. Notes on the Birds of the Magdalen Islands. Auk, 1889, pp. 144-150.

BIZZOZERO, G. Nuove ricerche sulla Struttura del Midollo delle Ossa negli Uccelli. Atti Ao. Tor. xxv, pp. 156-192, 1 pl. [not yet issued].

BLAAUW, F. E. Note sur la Collection d'Animaux réunie à s'Graveland (près Amsterdam). Bull. Soc. Acclim. 1889, pp. 49-51.

BLANFORD, W. T. [See OATES, E.]

BLASIVS, R. Beiträge zur Ornithologie Japan's. Monatschr. Schutz Vogelw. 1889, pp. 89-103, 2 pls.

The material for this paper was afforded by a small collection of skins from Tokio. [See *Phasianidae*.]

BOCAGE, J. V. BARBOZA DU. Breves Considerações sobre a Fauna de S. Thomé. J. Sci. Lib. (2) i, pp. 31-36.

— [See also *Ploceidae*, *Nectariniidae*.]

BONJOUR, S. [See *Certhiidae* (pathol.).]

*BONOMI, A. Nuove Contribuzioni alla Avifauna tridentina. Roveredo: 1889. [Cf. MT. orn. Ver. Wien, 1889, pp. 446-453 & 458-461, and Zool. Rec. xxi, *Aves*, p. 6.]

BONSDORFF, A. V. Ornitologiska iakttagelser, gjorda hufvudsakligast inom Salmis socken om våren 1881. Med. Soc. Fenn. xv [1886], pp. 24-43.

BORGGREVE, —. Tabelle zur Bestimmung der Raubvogel Deutschlands. Zeitschr. f. Orn. u. prak. Geflüg. 1883, pp. 33-41.

BRANDER, C. Parkano sockens foglar. Med. Soc. Fenn. xv [1886], pp. 97-128.

BRANDT, A. Anatomisches und Allgemeines über die sogenannte Hahenfедrigkeit und über anderweitige Geschlechtsanomalien bei Vögeln. I & II. Z. wiss. Zool. xlviii, pp. 101-190, pls. ix-xi.

This paper is divided into two portions, one termed introductory, the other general. In the former the assumption of male characteristics by the female is discussed, with the degrees of perfection found therein, the time of its appearance, the effect on the functions, and the concomitant biological phenomena. Anatomical data are superadded, with especial reference to the Redstart, Common Fowl, Black Grouse, and Capercaillie. In the second part, after a notice of the converse assumption by the male of female characters, both phenomena are considered in the light of their being normal peculiarities among certain Birds. Other classes of animals are next reviewed in the same connection, and the organs of generation are treated of, with the relation of the subject of the paper to Hermaphroditism. Various deductions conclude the work.

BREWSTER, W. [See *Fringillidæ*, *Hirundinidæ*, *Mniotiltidæ*, *Sylviidæ*, *Tanagridæ*, *Troglodytidæ*, *Tyrannidæ*, *Psittaci*, *Columbidæ*.]

BRÉZOL, H. [See *Anatidæ*, *Gallinæ*, *Struthionidæ*.]

BRITTAIN, J., & COX, P. [JUN.]. Notes on the Summer Birds of the Restigouche Valley, New Brunswick. Ank, 1889, pp. 116-119.

BRISAY [MARQUIS DE]. Note sur la Chasse aux Oiseaux dans l'Inde. Bull. Soc. Acclim. 1889, pp. 340-346.

— [See also *Columbidæ*.]

BRONN, H. G. [See GADOW, H.]

BROOKS, W. E. [Note on W. W. Cordeaux's paper on the Birds of Cashmere, &c., and on Vol. V of the Catalogue of Birds in the British Museum.] Ibis, 1889, pp. 575-577. [Cf. Zool. Rec. xxv, *Aves*, p. 11.]

BROWNE, M. The Vertebrate Animals of Leicestershire and Rutland. Birmingham & Leicester: 1889, sm. 4to, xii & 223 pp., 4 pls., map. Birds, pp. 39-172.

BRUSINA, S. Nove ornitološke bilješke. Agram: 1889, 8vo, 17 pp. [Soc. Hist. Nat. Croatica, iv.]

— Srpska kraljevska akademija spomenik. 1. Piltze khrvatsko-erpske, &c. [Memoirs of the Royal Servian Academy. 1. The Birds of Croatia and Servia, with regard to the whole southern part of Slavouia. Preliminary to a Croatio-Servian Ornithology. Belgrade: 1888, 4to, 51 pp.]

BRYDEN, H. A. *Kloof and Karroo : Sport, Legend, and Natural History in Cape Colony, with a notice of the Game Birds, and of the present distribution of the Antelopes and Larger Game.* London: 1889, 8vo, xiv & 435 pp., 17 pls.

Chap. ix (pp. 146-155) contains an account of the Birds of prey in Cape Colony, chap. xvii (pp. 305-323) of the game Birds of Cape Colony.

BULLER, W. L. [See *Eudytes (Spheniscidæ)*.]

BUREAU, L. [See *Otididæ*.]

BUTLER, A. G. A few Remarks respecting Insects supposed to be distasteful to Birds. *Ann. N. H.* (6) iv [1889], pp. 171-173. [Remarks upon this; E. B. POULTON, *t. c.* pp. 358-360.]

— Notes made during the Summer of 1887 on the Effect of offering various Insects, Larvæ, and Pupæ to Birds. *T. c.* pp. 463-473.

BUTLER, G. W. On the Subdivision of the Body-Cavity in Lizards, Crocodiles, and Birds. *P. Z. S.* 1889, pp. 452-474, pls. xlii-xlix.

This paper is divided into five parts (with conclusions &c.); the second and third of these alone refer to Birds, and contain: (ii) the subdivision of the body-cavity in the adult fowl; (iii) the development and homologies of the various septa in the body-cavity of the chick (from the sixth day onwards)—the latter being again treated under five sections. The deductions, as far as relate to Birds, are—that the diaphragm is a single structure, completed about the tenth day of incubation and subsequently divided; that the main part of it is not homologous with that of Mammals; that the post-hepatic septum is composed of two parts with different developments and homologies.

BÜTTIKOFER, J. On a New Collection of Birds from South-Western Africa. *Notes Leyd. Mus.* xi [1889], pp. 65-79, pl. iv.

— Third List of Birds from South-Western Africa. *T. c.* pp. 192-200.

The collections on which these papers are founded were made at Gambos, Upper Cunene region, by P. J. van der Kellen. 49 and 15 species are added to the former list [*cf.* *Zool. Rec.* xxv, *Aves*, p. 9], of which 2 are new to science. [See *Bucerotidæ*, *Phasianidæ*.]

— Zoological Researches in Liberia. Fourth List of Birds. *T. c.* pp. 113-138, pl. vi. [*cf.* *Zool. Rec.* xxv, *Aves*, p. 9.]

The majority of the collections here described—the last which will be made for the present—are from Owen's Grove, Mt. Olive, and Galilee Mt., on the Farmington River; while a few come from Schieffelinville and from Paynesville, on the Messurado River. 11 species are new to Liberia, 1 to science. A table is given of all Birds known from the country. [See *Nectariniidæ*, *Strigæ*, *Phasianidæ*.]

— [See also *Laniidæ*, *Timeliidæ*, *Rollidæ*.]

CABANIS, J. [See *Meliphagidæ*, *Paradisæ* *lv*, *Meropidæ*, *Phasianidæ*.]

CAMPBELL, A. J. Oology of Australian Birds. Supplement V. Vict. Nat. v, pp. 160-164. [Cf. Zool. Rec. xxv, Aves, pp. 9 & 29.]

Eopsaltria capito, *Stictoptera annulosa*, *Elureduus maculosus*, *Rhipidura preissi*, *Sphecotheres nazillaris*.

— Notes from Malden Island. *Op. cit.* vi, pp. 123-126.

Entirely on Birds.

CAMERANO, L. Note Zoologiche. 1. Di un caso di ovum in ovo. 2. Anomalia nelle zampe di un *Coccothraustes vulgaris*, Pallas. 3. Di alcuni parassiti del Triton. Boll. Mus. Zool. Anat. Comp. Torino, iv [1889], No. 65, 3 pp.

ČAPEK, V. Normaltag des ersten vollständigen Geleges. MT. orn. Ver. Wien, 1889, pp. 115-117.

*CARAZZI, D. Materiali per una Avifauna del Golfo di Spezia e della Val di Magra. 2^a Appendice. Spezia: 1889, 8vo, 4 pp. [Cf. Zool. Rec. xxiv, Aves, p. 7.]

Four more species are added, and one removed.

CARTER, T. Notes from Western Australia. Zool. 1889, pp. 267 & 268. [Cf. Zool. Rec. xxv, Aves, p. 10.]

CATCHPOOL, E. The Flight of Birds and Insects. Midl. Nat. 1889, pp. 221-225 & 261-264. [See BAINES, A. C., COURTENAY, R., FROUDE, R. E., KENT, W., MACGREGOR, J. G., OLIVER, J. E., PEALE, S. E., RAYLEIGH (LORD).]

CHAMBERLAIN, M. [See HAGERUP, A.]

CHAPMAN, A. Bird-Life of the Borders. Records of Wild Sport and Natural History on Moorland and Sea. London: 1889, 8vo, xii & 2x6 pp., 54 illustrations.

A pleasant book for sportsman or ornithologist, with good descriptions of the habits of many species at different seasons of year, and woodcuts of various phases of Bird-life.

CHAPMAN, F. M. Notes on Birds observed in the Vicinity of Englewood, New Jersey. Auk, 1889, pp. 302-305.

— [See also *Trochilida*.]

CHEESEMAN, T. F. On some Birds from the Kermadec Islands. Tr. N. Z. Inst. xxi [1889], pp. 121-124.

CLARKE, W. E. On the Ornithology of the Valleys of Andorra and the Upper Ariège, and other Contributions to the Avifauna of the Eastern Pyrenees. Ibis, 1889, pp. 520-552.

This paper contains an interesting account of the districts visited; the avifauna was found, on the whole, to be poor, and, with the exception of nests of *Turdus musicus*, *Corvus corone*, *Columba palumbus*, and *Ægialitis creonica* [on the Mediterranean], the results were somewhat disappointing.

— [See also *Fringillidæ*.]

COPENBATH, J. E. Phänologische Notizen aus Holland. Ornith., 1889 [v], pp. 333-335.

COPE, E. D. Synopsis of the Families of *Vertebrata*. *Am. Nat.* 1889. pp. 849-877.

Aves, pp. 869-873. The writer differs from Stejneger as to classification [cf. *Zool. Rec.* xxii, *Aves*, p. 14] only in making two new orders, viz.:—*HETEROSPONDYL* [for the *Steatornithidæ*] and *PULLASTRÆ* [for the *Megapodidæ*, *Cracidæ*, *Pteroclidæ*, *Columbidæ*, and *Dididæ*]; while he raises from the position of superfamilies to orders the *Colioidæ*, *Trogonoidæ*, and *Micropodoideæ* of that author. All superfamilies ending in *-oidæ* he changes to *-oidei*.

CORDEAUX, J. [Bird] Notes from the Yorkshire and Lincolnshire Coasts in the Autumn of 1888. *Naturalist*, 1889, pp. 1-4.

—. Bird Notes from the Humber District. *T. c.* 1889, p. 44.

—. Ornithological Notes from N.E. Lincolnshire and Holderness. *T. c.* pp. 129 & 130.

CORNWALL, E. M. Collecting near Home. *Vict. Nat.* vi, pp. 98-103.

CORY, C. B. The Birds of the West Indies, including all Species known to occur in the Bahama Islands, the Greater Antilles, the Caymans, and the Lesser Antilles, excepting the Islands of Tobago and Trinidad. Boston: 1889, 8vo, 324 pp., 2 maps, and cuts.

This is a republication of the author's articles in the *Auk* [cf. *Zool. Rec.* xxv, *Aves*, p. 12], with large additions, including maps and cuts, and a bibliography of West Indian ornithology.

—. A List of Birds collected by Mr. C. J. Maynard in the Islands of Little Cayman and Cayman Brack, West Indies. *Auk*, 1889, pp. 30-32.

The species are very different from those in Grand Cayman.

—. Notes on West Indian Birds. *T. c.* pp. 218 & 219. [See *Cerebidæ*.]

COUES, E. *Encyclopædia Americana*. Vol. iv. Artt., Night Hawk, Night Heron, cuts [from Check-List of Am. Birds], Partridge [*Tetraonina*, *Odontophorina*, cut of *Lophortyx californica*]. pp. 50, 51, 144 & 145.

—. [See also *Striges*.]

COURTENAY, R. Sailing Flight of large Birds over Land. *Nature*, xi [1889], p. 573. [See BAINES, A. C., CATCHPOOL, E., FROUDE, R. E., KENT, W., MACGREGOR, J. G., OLIVER, J. E., PEALE, S. E., RAYLEIGH (LORD).]

COWPER, J. Hexadactylism, with especial Reference to the Signification of its Occurrence in a Variety of the *Gallus domesticus*. *J. Anat. Phys.* xxiii, pp. 242-248, cut.

COX, J. D. & HAMILTON, A. G. A List of the Birds of the Mudgee District, with Notes on their Habits. *P. Linn. Soc. N.S.W.* iv, pp. 395-424.

COX, P. A Bird Wave. *Auk*, 1889, pp. 241-243.

A continuous flight of Birds, lasting more than two hours.

COX, P. [JUN.]. [See BRITTAI, J.]

CRETÉ DE PALLUEL, A. Note sur la Destruction des Oiseaux par les Fils télégraphiques et autres Engins analogues. Bull. Soc. Acclim. 1889, pp. 620-629.

CUCCATI, G. Istogenesi ed Istologia del Becco e della Lingua dei Polli, delle Anitra e delle Oche: nota preventiva. Bologna: 1889, 8vo, 10 pp.

DALGLEISH, J. J. Notes on a Collection of Birds and Eggs from the Republic of Paraguay. P. Phys. Soc. Edinb. 1888-89, pp. 73-88, map. [Cf. Zool. Rec. xxi, *Aves*, p. 11.]

The author gives good accounts of the breeding of most of the 28 species he mentions.

DALLA-TORRE, K. W. v. Die Fauna von Helgoland. Zool. Jahrb., Supplement-heft, ii, 99 pp. [*Aves*, pp. 25-43.]

—. [See also TSCHUSI ZU SCHMIDHOFFEN, V. v.]

DAVIE, O. Nests and Eggs of North American Birds. Third edition. Revised and Augmented. Columbia: 1889, 8vo, 8, 455, & xii pp., xiii pls.

Practically a new work.

DAVIES, H. R. Die Entwicklung der Feder und ihre Beziehungen zu anderen Integumentgebilden. Morph. JB. xv, pp. 560-645, pls. xxiii-xxvi.

Historischer Überblick. Untersuchung.—1. Die Entwicklung der Erstlingsdune. 2. Die Entwicklung der definitiven Feder. 3. Über die Aufeinanderfolge und räumliche Vertheilung der Federn. 4. Ueber die Homologen der sogenannten Laufschuppen. 5. Die Entwicklung des Stachels. Schlussbetrachtungen.

DE VIS, C. W. [See *Laniidæ*, *Paradiseidæ*, *Sylviidæ*, *Turdidæ*, and *Formæ sedis incertæ*.]

DIEDERICH, F. Die Vogelwelt in Emin Pascha's Ländern. Monatschr. Schutze Vogelw. 1889, pp. 116-122, 157-164, 177-184, & 214-222.

—. [See also *Corvidæ*.]

DIONNE, C.-E. Catalogue des Oiseaux de la Province de Québec, avec des Notes sur leur Distribution Géographique. Québec: 1889, 8vo, 119 pp. [Local names in French.]

DÖBNER, —. Beiträge zur Fauna von Aschaffenburg. MT. Ver. Aschaffenburg, ii, pp. 11-28. *Aves*, pp. 14-24.

Merely a list.

DOLLO, L. Le Vol chez les Vertébrés. Rev. Quest. Sci. 1889, pp. 146-207 & 410-485.

Chapter vii is on *Archæopteryx*, ch. viii on Flying Birds; ch. ix on Non-flying Birds.

DOMBROWSKI, E. v. Beiträge zur Kenntniss der Vogelwelt des Neusiedlersees in Ungarn. MT. orn. Ver. Wien, 1889, pp. 3-6, 19-22, 39-44, & 52-59. [*Cf. Zool. Rec. xxv, Aves, p. 13.*]

— Ornithologische Ergebnisse einer Studienreise nach Bosnien. T. c. pp. 293-297, 307-309, 316-320, 329-331, & 342-344.

DOWKER, G. Notes on the British Birds of East Kent, with subsequent additions and tabulated list. N. E. Kent Nat. Hist. Soc. 1889, pp. 81-119.

DRESSER, H. E. Notes on Birds collected by Dr. G. Radde in the Transcaspiian Region. Ibis, 1889, pp. 85-92, pl. v.

A preliminary notice; for full particulars, see RADDE, G. [*See also Laniidae, Paridae.*]

DUTCHER, B. H. Bird Notes from Little Gull Island, Suffolk Co., N. Y. Auk, 1889, pp. 124-131.

—, W. Bird Notes from Long Island, New York. T. c. pp. 131-139.

EAMES, E. H. [*See Mniotiltidae.*]

ECKSTEIN, K. Aus dem Minneleben der Vögel. J. f. O. 1889, pp. 177-179.

— Ein Ei in der Leibeshöhle eines Haushuhnes. T. c. pp. 179 & 180.

EHRENREICH, —. Mittheilungen über die Zählung und das Gefangenhalten wilder Thiere bei den Indianern Südamerikas. T. c. pp. 335-337.

On the taming and caging of wild animals by the South American Indians.

ELLIOT, D. G. [*See Trochilidae.*]

ENWALD, R. Ornithologiska Anteckningar, gjorda i norra delen af finska naturhistoriska Området. Med. Soc. Fenn. xv [1886], pp. 1-23.

ETHERIDGE, R. [JUN.] & RAMSAY, E. P. Lord Howe Island. Its Zoology, Geology, and Physical Characters. Mem. No. 2 of the Australian Museum, Sydney. Sydney: 1889, 8vo, 132 pp., 10 pls. & frontis.

Containing:—(1) General Zoology, by R. ETHERIDGE, JUN. [*Aves, pp. 1-18*], (2) Notes on the Oology of Lord Howe Island, by A. J. NORTH, q. r. The Birds are determined by E. P. RAMSAY. [*See Falconidae, Sulidae, Rallidae, Procellariidae.*]

EVANS, W. [*See Pteroclidæ.*]

EVERETT, A. H. Remarks on the Zoo-Geographical Relationships of the Island of Palawan and some adjacent Islands. P. Z. S. 1889, pp. 220-228.

The fauna (Birds and Mammals), as well as the geological data, tend to show that this island, with Cagayan Sulu and Sibutu, belong to the Bornean rather than to the Philippine sub-area.

EVERMANN, B. W. Birds of Carroll County, Indiana. Auk, 1889, pp. 22-30. [*Cf. Zool. Rec. xxv, Aves, p. 13.*]

FATIO, V., & STUDER, T. Catalogue des Oiseaux de la Suisse, élaboré par ordre du Département fédéral de l'industrie et de l'agriculture. Pt. 1. Rapaces diurnes. Geneva : 1889, 8vo, pp. 1-108, vii pls.

The first plate is a map of Switzerland, divided according to the various watersheds. The others are charts of distribution of the different species. This work appears to be also published in CR. Soc. Phys. Nat. Hist. Genève [Arch. Sci. Nat.] for 1889, which is not yet obtainable here.

FAXON, W. On the Summer Birds of Berkshire County, Massachusetts. Auk, 1889, pp. 39-46 & 99-107.

The avifauna is found to be very similar to that of the Catskill region.

FEILDEN, H. W. On the Birds of Barbados. Ibis, 1889, pp. 477-503.

An account of the avifauna as observed during a year's visit, with a sketch of the geology of the island. Not more than 15 species are resident. [See *Larida*, and cf. Zool. Rec. xxv, *Aves*, p. 90.]

——. [See also *Procellariidæ*.]

FELLNER, — v. Experimente über Hin- und Rückflug der Militär Brief-tauben. Berlin : 1889, 16mo, 32 pp.

FERDINAND [PRINCE OF BULGARIA]. [See *Sturnidæ*.]

FICKERT, C. Beiträge zur Fauna der Umgebung von Tübingen. JH. Ver. Württ. 1889, pp. 361-364.

A few notes on Birds are included.

FISHER, A. K. [See MERRIAM, C. H.]

FOURNES, H. Verzeichniss der Vogeleier-Sammlung des Ornithologischen Vereines in Wien. MT. orn. Ver. Wien, 1889, pp. 196-200, 206-208, & 219-224.

FOWLER, W. W. [See *Hirundinidæ*.]

FRANK, K. Ornithologische Beobachtungen vom Neuvorpommerschen Ostseestrande. Zeitschr. f. Orn. u. prak. Geflug. 1889, pp. 122-128.

FRENCH, C. [JUN.]. Notes on a Collecting Trip to Swan Hill District. Vict. Nat. vi [1889], pp. 95-98.

Some remarks are made on the Birds.

FROUDE, R. E. Sailing Flight of Albatross. Nature, xl [1889], p. 102. [See BAINES, A. C., CATCHPOOL, E., COURTENAY, R., KENT, W., MACGREGOR, J. G., OLIVER, J. E., PEALE, S. E., RAYLEIGH (LORD).]

FÜRRBRINGER, M. Einige Bemerkungen über die Stellung von *Stringops* und den eventuellen Herd der Entstehung der Papageien, sowie über den systematischen Platz von *Iynx*. J. f. O. 1889, pp. 236-245.

The author concludes that *Stringops*, while not the oldest form among the Parrots, is very old ; that the original home of the latter is not to be determined with certainty, though a slight preference may be given to the Oriental and Australian regions over the European and American ; that *Iynx* is undoubtedly the more generalized form, other *Picidæ* being more specialized.

GADOW, H. On the Taxonomic Value of the Intestinal Convolutions in Birds. P. Z. S. 1889, pp. 303-316, pl. xxxii, cut.

The writer begins this exceptionally lucid and valuable paper with an account of the different varieties of intestinal convolutions in Birds and of their nomenclature. He next discusses—and represents in the plate—the “taxonomic value of those characters which are exhibited by the modes in which the mid-gut is stowed away in the abdominal cavity”; and finds that the arrangements, of which he gives a table, are much more constant than was formerly supposed, both in species and in whole families. He agrees with Fürbringer in recognizing a combination CORACORNITHES. Among the conclusions, apart from this group, we may notice in especial the deduction of an affinity between the *Columbae*, *Limicolæ*, and *Laridæ*, the *Steganopodes*, *Herodii*, *Tubinares*, and *Spheniscidæ*, with the intermediate position of the *Tubinares* between the *Laro-Limicolæ* and *Steganopodes*; and, above all, some unexpected resemblances between the *Pelargi* and *Raptores diurni*. Within the CORACORNITHES the *Coccygæ* are lowest (somewhat resembling the *Gallinæ* and *Opisthocomus*); the *Picidæ*, *Capitonidæ*, and *Rhamphastidæ* may be collectively termed *PICI*, and the *Coraciidæ* and *Alcedinidæ* *HALCTONES*, leaving the other Picarian families in close connection, with the *Strigæ* farther off. The PASSERES are quite uniform in character.

— [BRONN, H. G.] Klassen und Ordnungen des Thierreichs, wissenschaftlich dargestellt in Wort und Bild. Fortgesetzt von Dr. HANS GADOW in Cambridge. Sechster Band. iv. Abtheilung. Vögel: *Aves* [Integument, contd., Federn (Die Entwicklung der Federn, Bau und Eintheilung der Federn, Die Formen der Erstlingsfeder und das Nestkleid, Die Mauser, Pterylographie, Die Farben der Federn, Zeichnung der Federn), Hautmuskeln, Verdauungssystem, Die Mundhöhle, Die Zunge, Der Schlund, Magen, Drüsenmagen, Muskelmagen, Die Leber, Das Pancreas, Der Darm, Die Blinddärme, Länge und Weite des Darmes, Variiren der Darmlänge bei Vögeln einer Art, Darmlagerung]. 23-27 Lieferung, pp. 513-701, pls. xlvii, xlviii, xxxiv, & xxxv [Zähne, Schuppen, und Federn, Federfluren und Federn, Mundhöhle und Kropf, Schlund und Magen], 10 cuts. Leipzig und Heidelberg: 1889, 8vo. [Cf. Zool. Rec. xxv, *Aves*, p. 17.]

GALLERANI, G. L'Étude des substitutions fonctionelles dans le Cerveau proprement dit, faite sur les Pigeons, comme contribution à la Physiologie des Commissures. Arch. Ital. Biol. xii, pp. xxxv-xxxvii.

GÄTKE, H. [See *Sylviida*.]

GIGLIOLI, E. H. Primo Resoconto dei Risultati della Inchiesta Ornitologica in Italia. Parte Prima. Avifauna Italiana, Elenco sistematico delle Specie di Uccelli stazionarie o di passaggio in Italia con nuovi nomi volgari e colle notizie sin qui fornite dai Collaboratori nella Inchiesta Ornitologica. Firenze: 1889, 8vo, vii & 706 pp., map.

The scope of the work includes Sardinia and Sicily, while indices are given of scientific and popular names. [Pt. ii is dated 1890.]

[GIGLIOLI, E. H.] [See also SALVADORI, T.]

— & MANZELLA, A. Iconografia dell' Avifauna Italica, ovvero Tavole illustranti le Specie di Uccelli che trovansi in Italia con brevi descrizioni e note. Prato (Toscana): 1889, fol., pts. xlv & xlv, pagin. discount. [Cf. Zool. Rec. xxv, *Aves*, p. 18.]

The species figured are:—*Picus lilfordi*, *P. leuconotus*, *P. medius*, *Picoides tridactylus*, *Gecinus canus* (pt. xlv), *Nisaetus fasciatus*, *N. pennatus*, *Buteo ferox*, *Archibuteo lagopus*, *Milvus iclinus* (pt. xlv).

GILES, E. Australia Twice Traversed: the Romance of Exploration. London: 1889, 8vo, vol. i, lix & 320 pp., 22 illustr., 3 maps; vol. ii, xi & 363 pp., 23 illustr., 3 maps.

Notices of Birds are scattered throughout.

GIVOIS, A. Les Oiseaux du plateau central. Rev. Sci. Bourb. ii, pp. 74–80, 195–205, & 242–245.

GODMAN, F. D. [See SALVIN, O.]

GODMAN, F. D., & SALVIN, O. Biologia Centrali-Americana; or, Contributions to the Knowledge of the Fauna and Flora of Mexico and Central America. London: 1889, 4to, Zoology, pts. lxxiii & lxxiv; *Aves*, vol. ii, pp. 41–104, pls. xxxvii–xl.

The genera treated are *Myiozetetes*, *Pitangus*, *Sirystes*, *Myiodynastes*, *Megarhynchus*, *Muscivora*, *Cnipodectes*, *Myiobius*, *Pyrocephalus*, *Sayornis*, *Mitrephanes*, *Empidonax*, *Contopus*, *Myiarchus*, *Tyrannus*, and *Milvulus* [pt.] [Cf. Zool. Rec. xxv, *Aves*, p. 18; and see *Tyrannidae* for plates and remarks on species.]

GODRY, E. Note sur les Élevages de la Faisanderie du Chateau de Galmanche (près Caen). Bull. Soc. Acclim. 1899, pp. 8–11.

Goss, N. S. Additions to the Catalogue of the Birds of Kansas, with Notes in regard to their Habits. Auk, 1889, pp. 122–124. [Cf. Zool. Rec. xxv, *Aves*, p. 18.]

GREENE, W. T. The Birds in my Garden. London: 1889, Rel. Tract Soc.

GUILLEMARD, F. H. H. Cyprus and its Birds in 1888. Ibis, 1889, pp. 206–219. [Cf. Zool. Rec. xxv, *Aves*, p. 19, and see LILFORD (LORD).]

GURNEY, J. H. Remarks on Sclater & Hudson's 'Argentine Ornithology,' Vol. II. Ibis, 1889, pp. 397 & 398.

— [See also *Sylviidae*, *Striges*.]

GURNEY, J. H. [JUN.]. Ornithological Notes from Norfolk. Zool. 1889, pp. 13–18, 134–136, & 334–337. [Cf. Zool. Rec. xxv, *Aves*, p. 19.]

HAGERUP, A. Some Account of the Birds of Southern Greenland. Edited by M. CHAMBERLAIN. Auk, 1889, pp. 211–218 & 291–297.

Interesting notes as to the status of Birds as residents or migrants, and so forth.

HAMILTON, A. G. [See COX, J. D.]

HANSSON, C. A. Zoologiska anteckningar från norra Bohuslän. *Cfr.*
Ak. Förh. 1889, pp. 289-327.

The chief part of these notes on a Swedish district refers to Birds (pp. 294-324).

HARGITT, E. [See *Picidae*.]

HARTERT, E. Zur Ornithologie der indischmalayischen Gegenden (mit
Oologischen Beiträgen von Oberstabsarzt Dr. Kutter). J. f. O. 1889,
pp. 345-440.

The author collected, during 1888, in Pankow, Penang, Sumatra, Salanga, Perak, Upper Assam and N. India, and gives the results under four separate heads, corresponding to the districts. He pays special attention to the measurements of Birds and nests, while fresh, and adds many useful field-notes, with details of the nesting, the eggs, and young. [See *Timeliidae*, *Picidae*.]

— Eugen Ferdinand von Homeyer, sein Streiben und Schaffen. T. c.
pp. 231-236.

HARTING, J. E. Of Hawks and Hounds in Essex in the Olden Time.
Ess. Nat. 1889, pp. 189-198.

— The Birds of Hampstead [in 'Hampstead Hill,' by J. L. Lobley].
London : 1889, sq. 8vo, pp. 86-99.

— Memoir of the late Frederick Bond, F.Z.S., F.E.S. Zool. 1889,
pp. 401-422.

Of much interest to all ornithologists.

— Our Summer Migrants: an Account of the Migratory Birds
which pass the summer in the British Islands. Illustrated from
designs by T. Bewick. 2nd ed. London : 1889, 8vo, 324 pp.

HARTLAUB, G. Aus den Ornithologischen Tagebüchern Dr. Emin
Pascha's. No. III. *Estrelida nannula*, Hartl.; No. iv. *Bradyornis
pallida*, v. Müll. J. f. O. 1889, pp. 46-50. [Cf. Zool. Rec. xiv,
Aves, p. 20; and see *Laniidae*, *Ploceidae*.]

— Ornithologische Beiträge. I. Zur Kenntniss der Gattung *Psittacula*, Briss. II. Zu *Salpornis*. III. Kritisches zu *Dryoscopus*, Boie.
T. c. pp. 113-120. [See *Psittaci*, *Certhiidae*, *Picidae*.]

HARTWIG, W. Ornithologische Beobachtungen auf eine Reise nach dem
Nordeap. T. c. pp. 137-153.

The author's list, comprising 31 species, is followed by short accounts
of three or four Bird-rocks and of the Museum of Tromsø, near which
town 96 species are found breeding.

HARVIE-BROWN, J. A. [See MACPHERSON, H. A.]

HASBROUCK, E. M. Summer Birds of Eastland County, Texas. Auk,
1889, pp. 236-241.

HAYEK, G. v. Handbuch der Zoologie. IV, I. II. Abth. Höhere Wirbel-
thiere. [*Aves*, pp. 1, 2, & 131-240, figs. 2804, 2805 & 3038-3231.]
Wien : 1889, 8vo.

•HEERWAGEN, A. Beiträge zur Kenntniss des Kiefergaumen-Apparates der Vögel. Nürnberg : 1889, 8vo, 53 pp., 1 pl., 6 cuts.

HEILPRIN, A. The Bermuda Islands : a Contribution to the Physical History and Zoology of the Somers Archipelago, with an examination of the Structure of Coral Reefs. Philadelphia : 1889, 8vo, iv & 231 pp., 17 pls., and frontis.

A few notes on Birds, pp. 81-83.

HELM, F. [See MEYER, A. B.]

HENNICKE, K. R. Die Entwicklung der Feder. Monatschr. Schutzze Vogelw. 1889, pp. 223-226.

— . Das Sehorgan der Vögel. T. c. pp. 538-547, 5 cuts.

HEPBUEN, D. The Development of Diarthrodial Joints in Birds and Mammals. P. R. Soc. Edinb. xvi, pp. 258-261.

The development was traced, in a series of microscopic sections through the limbs of embryos of the common fowl, from the fourth day of incubation to that of hatching.

— . The Development of Diarthrodial Joints in Birds and Mammals. J. Anat. Phys. xxiii, pp. 507-522, pl. xxii.

HERRERA, A. L. [See *Cracida*.]

HICKSON, S. J. A Naturalist in North Celebes ; a Narrative of Travels in Minahassa, the Sangir and Talaut Islands, with notices of the Fauna, Flora, and Ethnology of the Districts visited. London : 1889, 8vo, xv & 392 pp., 35 illustr., 2 maps.

While occasional notices of Birds occur throughout the work, pp. 81-105 are devoted to the fauna of Taliase Island, and pp. 190 & 191 to the ornithology of the Sangir Islands.

HODEK, E. Aus Niederösterreich zwischen der Ybbs und Donau. MT. orn. Ver Wien, 1889, pp. 17-19 & 36-38. [Cf. Zool. Rec. xxv, *Aves*, p. 20.]

HOLLMERUS, A. L. Ornitologiska iakttagelser i Sotkamo och Kuhmoniemi socknär åren 1863-1885. Med. Soc. Fenn. xv (1886), pp. 82-96.

HOPKINSON, J. Notes on Birds observed in Hertfordshire during the year 1888. Tr. Hertf. Soc. 1889, pp. 139-146.

[See *Pteroclidæ*.]

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These papers refer partly to Birds, the remarks on which are answered by A. NEWTON, t. c. pp. 318 & 389.

HUDSON, W. H. [See SCLATER, P. L.]

HUET, — . [See *Phasianidæ*.]

HUME, A. O. [See OATES, E.]

1889. [VOL. XXVI.]

JEFFRIES, W. A. Birds observed at Santa Barbara, California. *Auk*, 1889, pp. 220-223.

— & J. A. Notes on Western North Carolina Birds. *T. c.* pp. 119-122.

*JEGOROW, J. Otnoshenie simpaticheskagho nerva k gholovnim ukrasheniyam nyekotoruiikh ptits. *Trudni obsch. Kazan*, xi, pp. 279-306. [*Cf. Zool. Rec.* xxi, *Aves*, p. 16.]

JOHNSON, F. P. Field Notes in Western Sweden. *Zool.* 1889, pp. 126-130.

Interesting notes from Loch Änn.

JONES, H. L. [See SHORE, T. W.]

*JORDAN, D. S. A Manual of the Vertebrate Animals of the United States, including the District north and east of the Ozark Mountains, south of the Laurentian Hills, north of the southern boundary of Virginia, and east of the Missouri River, inclusive of Marine Species. 5th edition, entirely re-written and enlarged. Chicago: 1888, 8vo, iii & 375 pp.

JOUAN, H. Trois Oiseaux rares à Cherbourg. *Mém. Soc. Cherb.* xvi [1889], pp. 191-194.

KAIGHORODOV, D. N. Ornitologicheskaya nablyudeniya iz okrestnostei Okhtenskagho porokhovagho zavoda. *Trudni St. Petersburg Nat.* xvi [1885], pp. 463-504.

Ornithological observations from the neighbourhood of Okhtensk powder manufactory.

KAISER, A. Verzeichniss ägyptischer Thiere beobachtet vom 1st July, 1885, bis 1st July, 1887. *Ber. St. Gall. Ges.* 1887-88, pp. 160-172. [*Aves*, pp. 173-181.]

KEARTLAND, G. A. The Birds of Melton. *Vict. Nat.* vi, pp. 70-72.

KELLER, F. C. Ornithologiae. Die Vögel Kärntens. *JB. Mus. Kärnt.* xx, pp. 177-244.

Rapaces, Fissirostres, Insectivores, Coracae.

KEMPEN, C. VAN. Sur quelques Oiseaux rares du Nord de la France. *Bull. Soc. Zool. Fr.* xiv, pp. 104-107. [See *Sulidae, Procellariidae*.]

KENT, W. The Soaring of Birds. *Science*, 1889, p. 71. [See BAINES, A. C., CATCHPOOL, E., COURTENAY, R., FROUDE, R. E., MACGREGOR, J. G., OLIVER, J. E., PEALE, S. E., RAYLEIGH (LORD).]

KIRK, T. W. Notes on some New Zealand Birds. *Ibis*, 1889, pp. 296-299. [See *Muscicapidae, Cypselidae*.]

— Ornithological Notes. *Tr. N. Z. Inst.* xx [1888], pp. 29-31.

— Notes on some New Zealand Birds. *Op. cit.* xxi [1889], pp. 230-233.

KHLYEBNIKOV, V. A. Materialui k faunye pozvonochnuikh Borovichakagho uyezda Novgorodskoi gubernii. [Materials for a vertebrate fauna of the pine-forest district of Novgorod government.] Trudui St. Petersburg Nat. 1888, pp. 21-58.

All the article treats of Birds.

KNAUER, F. Eine Instructionsreise nach der Adria, nach Norddeutschland, Holland, Belgien, und Westdeutschland. MT. orn. Ver. Wien, 1889, pp. 297-300, 309-312, 321-324, & 331-334.

KOCH, A. Mittel- und West-Florida, Frühjahr 1889. T. c. pp. 505-509, 518-520, 530-532, 592, & 593.

KÖNIG, A. [See *Fringillidæ*, *Sylviidæ*, *Picidæ*, *Falconidæ*.]

KÖNIG-WARTHAUSEN, R. Naturwissenschaftlicher Jahresbericht 1887. JH. Ver. Württ. 1889, pp. 139-216.

Almost entirely concerned with Birds.

— [See also *Fringillidæ*.]

KOORDERS, S. H. Verslag van eene Dienstrees naar de Karimon-Djawa-Eilanden. Tijdschr. Nederl. Ind. xlviii, pp. 20-132. [*Aves*, pp. 114-117.]

KRISO, F. Das Präparieren und Conservieren der Vögel und ihrer Eier. Nach der Methode des P. Blasius Hanf. MT. Ver. Steierr. 1888, pp. xciii-cii.

KUTTER, F. [See **HARTERT, E.**]

LANGDON, F. W. On the Occurrence in large numbers of seventeen species of Birds. J. Cincinn. Soc. xii, pp. 57-63.

LAVOCAT, A. Côtes et Sternum des Vertébrés. Mém. Ac. Toulouse (9) i, pp. 39-55, 1 pl. [*Aves*, pp. 48 & 49.]

LAWRENCE, G. N. Remarks upon Abnormal Colouring of Plumage observed in several Species of Birds. Auk, 1889, pp. 46-50.

The validity of *Psittovius ceruleus* is discussed.

— An Account of the Former Abundance of some species of Birds on New York Island at the time of their Migration to the South. T. c. pp. 201-203.

— [See also *Fringillidæ*, *Procellariidæ*.]

LEDENFELD, R. v. Bilder aus dem Australischen Urwald —v. Der Emu. vi. Der weisse Kakadu. vii. Der Kea. viii. Der lachende Hans. ix. Der Leierschwanz. Zool. Gart. 1889, pp. 77-109.

LESCUYER, F. Mélanges d'Ornithologie. Saint-Dizier: 1888, 8vo, 165 pp.

LEVERKÜHN, P. Südamerikanische Nova aus dem Kieler Museum. J. f. O. 1889, pp. 101-109.

The author took in hand the identification of a rich series of 10,000 skins in the collection of the Zoological Institute of the Kiel University, chiefly from Behn's Voyage in the 'Galathea.' [See *Icteridæ*, *Sylviidæ*, *Dendrocolaptidæ*, *Formicariidæ*.]

[LEVERKÜHN, P.] Ueber Farbenvarietäten bei Vögeln II, III. *T. c.* pp. 120-136 & 245-262.

A study of Albinos from the Museums of Bremen, Göttingen, Kiel, Metz, Strasburg, and Colmar. [*Cf.* Zool. Rec. xxiv, *Aves*, p. 17.]

— Litterarisches über das Steppenhuhn. *Zeitschr. f. Orn. u. prak. Gefl.* 1889, pp. 17-20.

A short note, not connected with that below.

— Ein Flug durch die Schweiz. i-iv. *T. c.* pp. 135-142, 148-154, & 161-171. [*Cf.* p. 178.]

— Litterarisches über das Steppenhuhn. II. *Revue, nebst Original-Mittheilungen über die 1888er Invasion* I, II, III. *Monatschr. Schutze Vogelw.* 1889, pp. 343-351, 371-376, & 398-406. [*Cf.* Zool. Rec. xxv, *Aves*, p. 80.]

— [See also *Upupida*, *Alcida*.]

LIEBE, K. T. [See *Scolopacida*.]

LILFORD [LORD]. Coloured Figures of the Birds of the British Islands. London: 1889, 8vo, pts. x & xi. [*Cf.* Zool. Rec. xxv, *Aves*, p. 23.]

Containing Golden Eagle, Raven, Carrion-Crow, Jackdaw, Jay, Red-Billed Chough, Richard's Pipit, Lesser Spotted Woodpecker, Puffin, White-Fronted Goose, Shoveller, Red-Crested Pochard, Kite, Rufous Warbler, Hooded Crow, Barnacle Goose, Eagle-Owl, Dipper, Black-Breasted Dipper, Short-Eared Owl, Golden-Eye, Brown Owl, Red-Throated Pipit, Purple Heron.

— A List of the Birds of Cyprus. *Ibis*, 1889, pp. 305-350.

Compiled from the collections of F. H. H. Guillemard, W. Pearse, and the author himself, made during visits to the island, with the addition of notes on various species from the lists of Ungor and Kotschy, A. Müller, &c. [See GUILLEMARD, F. H. H.]

— Notes on the Ornithology of Northamptonshire and Neighbourhood. *Zool.* 1889, pp. 422-430. [*Cf.* Zool. Rec. xxv, *Aves*, p. 23.]

*LILIENTHAL, O. Der Vogelflug als Grundlage der Fliegekunst. Ein Beitrag zur Systematik der Flugtechnik. Berlin: 1889, 8vo, viii & 187 pp., 9 pls., 88 cuts.

LINDNER, F. [See *Scolopacida*.]

LINDFORSS, C. P. Sulkava sockens Foglar. *Med. Soc. Fenn.* xv [1886], pp. 51-81.

LINK, J. A. [See *Cuculidæ*.]

LITTLEDALE, H. Rough Notes of Travel and Sport [in 1888] in Kashmir and Little Tibet. *J. Bomb. N. H. Soc.* iv, pp. 98-118.

LORENZ, T. [See *Tetraonida*.]

*LOWIS, O. v. Die baltischen Raubvögel. *Baltisch. Monatschr.* xxxv, pp. 537-556 & 689-717.

LUCAS, A. H. S. On the Production of Colour in Birds' Eggs. Tr. R. Soc. Vict. xxiv [1887], pp. 52-60. [See MACPHERSON, A. H., WALLACE, A. R., TITCHENER, E. B.]

The writer considers the colours protective.

LUCAS, F. A. Costal Variations in Birds. Auk, 1889, pp. 195 & 196.

— [See also *Cypselidæ*, *Phalacrocoracidæ*.]

LUMHOLTZ, C. Among Cannibals. An account of four years' travels in Australia, and of Camp Life with the Aborigines of Queensland. London: 1889, 8vo, xx & 395 pp., 4 col. pls., 122 illustr., 2 maps.

A most interesting book, with notices of Birds throughout [pp. 21, 22, 27, 28, 33-35, 43, 56, 57, 73, 94-99, 139, 140, 149-151, 155, 171, 214, 215, 220, 253, 323, 326, 327, 329], and accounts of their breeding, habits, &c. The Appendix [pp. 353-388] has a chapter on the fauna, of which Birds fill pp. 382-384, but the best notes on them are in the main text.

LYDEKKER, R. [See NICHOLSON, H. A.]

MACINTYRE, D. Hindu-Koh: Wanderings and Wild Sport on and beyond the Himalayas. Edinburgh and London: 1889, 8vo, xx & 464 pp., 35 illustr.

A few notices of Birds occur.

MACGREGOR, J. G. The Soaring of Birds. Science, 1889, pp. 151 & 152. [See BAINES, A. G., CATCHPOOL, E., COURTENAY, R., FROUDE, R. E., KENT, W., OLIVER, J. E., PEALE, S. E., RAYLEIGH (LORD).]

MCLEAN, J. C. [See *Phalacrocoracidæ*.]

MACPHERSON, A. H. The Production of Colour in Birds' Eggs. Zool. 1889, pp. 248-253. [See LUCAS, A. H. S., WALLACE, A. R., TITCHENER, E. B.]

— H. A. Ornithological Notes from Cumberland. T. c. pp. 175-177.

— The Visitation of Pallas's Sand-Grouse to Scotland in 1888, together with an Account of its Nesting, Habits, and Migrations. Prepared chiefly from information collected by PROFESSOR NEWTON and J. A. HARVIE-BROWN, Esq. London: 1889, sm. 8vo, viii & 38 pp.

— [See also *Falconidæ*.]

MADARÁSZ, J. v. [See *Nectariniidæ*.]

MAFFUCCI, A. Recherches expérimentales sur l'action des Bacilles de la Tuberculose des Gallinacés et des Mammifères dans la vie embryonnaire et adulte du Poulet. Arch. Ital. Biol. xii, pp. xxix-xxxi.

MAGAUD D'AUBUSSON, L. [See *Anatidæ*, *Pteroclidæ*, *Struthionidæ*.]

MAIRET, A. [See *Phasianidæ*.]

MANGÉARD, A. Catalogue des Oiseaux qui se reproduisent dans les environs d'Autun et qui ont été observés depuis 1840 jusqu'en 1886. Bull. Soc. Autun, i [1888], pp. 102-120. [Cf. Zool. Rec. xxiii, *Aves*, p. 24.]

MANZELLA, A. [See GIGLIOLI, E. H.]

MARAGE, R. Anatomie descriptive du sympathique chez les Oiseaux. Ann. Sci. Nat. (Zool.) vii, pp. 1-72, pls. i-vi.

A very exhaustive paper on the above subject.

MARCACCI, A. Influence du mouvement sur le développement des œufs de poule. Arch. Ital. Biol. xi, pp. 164-171. [Cf. Zool. Rec. xrv. *Aves*, p. 26.]

MARSHALL, W. Zoologische Vorträge. i. Die Papagaien (*Psittaci*). ii. Die Spechte (*Pici*). Leipzig: 1889, 8vo, 63 & 76 pp. respectively. with 1 pl. in each.

The plates show the distribution of the various families or subfamilies. The letterpress is partly on the same subject, and partly treats of the groups in a general way.

MASIUS, J. Quelques notes sur le développement du cœur chez le Poulet. Arch. Biol. ix, pp. 403-418.

MATSCHIE, P. Die Kennzeichen der deutschen Raubvögel. Eine Anleitung zur sicheren Bestimmung unserer deutschen Tag- und Nachtraubvögel. J. f. O. 1889, pp. 67-72.

This work consists of elaborate keys to the genera and species of *Accipitres diurni* found in Germany, as well as to those of the *Accipitres nocturni*.

MEADE-WALDO, E. G. Notes on some Birds of the Canary Islands. Ibis, 1889, pp. 1-13.

The chief interest of this paper centres in trips to Gomera and Fuerteventura; on the latter of which, among other rare Birds, a new species of Stonechat was found.

——. Further Notes on the Birds of the Canary Islands. T. c. pp. 503-520, pls. xv & xvi.

Besides the two new species figured [*Sylviida*, *Parida*], the writer found many uncommon Birds breeding, and took good field notes on the Islands of Fuerteventura, Tenerife, and La Palma.

——. [See also *Sylviida*, *Parida*.]

MEINERT, F. *Philornis molesta*, en paa Fugle syltende Tachinarie. Vid. Medd. 1889, pp. 304-317, pl. vi.

A parasite on Birds.

MELA, A. J. [See PALMÉN, J. A.]

MENZBIER, M. A. Ornithologie du Turkestan et des pays adjacents. (Partie N. O. de la Mongolie, steppes Kirghiz, contrée Aralo-Caspienne, partie supérieure du bassin d'Oxus, Pamir.) Pt. ii. Moscow: 1889, sm. fol., pp. 113-208; with atlas, pt. ii, containing pls. iv, v, & xi [*Parida* and *Falconide*]. [Cf. Zool. Rec. xxv, *Aves*, p. 26.]

These plates are by Martinoff and Menzbier, while the title-page still bears the name of N. A. SEVERZOFF.

MERLATO, L. Sur la Chaleur emise par les Œufs d'Autruche pendant l'incubation. Bull. Soc. Acclim. 1889, pp. 750-752.

MERRIAM, C. H. Report of the Ornithologist and Mammalogist for the year 1888. From the Annual Report of the Department of Agriculture for the year 1888. Washington: 1889, 8vo, pp. 477-536.

General Report, including Geographical Distribution of species. Special Reports, including:—(1) Introduced Pheasants [by the Author]; (2) The Mink [by the same]; (3) The Sparrow Hawk [by A. K. FISHER]; (4) The Short-eared Owl [by the same]; (5) The food of Crows [by W. B. BARROWS]; (6) The Rose-Breasted Grosbeak, an enemy of the Potato-Bug [by the same].

— [See also BARROWS, W. B.]

MEYER, A. B. Abbildungen von Vogel-Skeletten herausgegeben mit Unterstützung der Generaldirection der königl. Sammlungen für Kunst und Wissenschaft in Dresden. Dresden: 1888-1889, 4to, pts. xii, pp. 65-71, pls. cxi-cxx, & xiii, pp. 1-8, pls. cxx-cxxx.

The former part completes vol. i, and with it are issued a titlepage, systematical and alphabetical index, list of works quoted, errata, and addenda. A new plate is substituted for pl. ci of pt. xi. The plates are of *Balearica pavonina*, Race-tauben Schädel, *Microcarbo pygmaeus*, *Querquedula crecca*, *Anas boschas*, *Dafila bahamensis*, *Anser cinereus*, *Platalea leucorodia*, *Ciconia alba*, *Ardea garzetta*, *Gyps fulvus*, *Buteo vulgaris*, *Asio accipitrinus*, *Nyctale tengmalmi*, *Strix flammea*, Dorking-Hahn, *Bonasa cupido*, *Syrhaptus paradoxus*, Almond-Tümmler, *Fulica atra*.

— Die Abrihtung der Brieftauben zum Hier und Rückfluge. Dresdner Journal, No. 280, pp. 1970 & 1971 [see also Gef. Welt, xix, 1890, pp. 2 & 3.] [Cf. FELLNER, — v.]

— [See also *Paradiseida*, *Sturnida*, *Tetraonida*.]

—, & HELM, F. iv. Jahresbericht (1888) der ornithologischen Beobachtungstationen im Königreich Sachsen. Nebst Anhängen über das Vorkommen des Rosenstaars in Europa im Jahre 1889 und in früheren Jahren, sowie über die Verbreitung der Kreuzotter im Königreich Sachsen. vi & 150 pp., map. [Cf. Zool. Rec. xxv, *Aves*, p. 27.] [In Zool. Rec. xxv, *Aves*, p. 27, *dele* "Also in Z. ges. Orn. 1887, pp. 194-412," which refers to the Jahresbericht for a former year.]

MICHEL, J. Eine Vermehrung der Ornith. Böhmens. MT. orn. Ver. Wien, 1889, pp. 397 & 398.

MILLS, W. Clinical and Pathological Notes from a Breeding Station. I. Scrofula and Tuberculosis in Birds. J. Comp. Med. 1889, pp. 243-247.

MILNE-EDWARDS, A., & OUSTALET, E. Études sur les Mammifères et les Oiseaux des Iles Comores. N. Arch. Mus. (2) x, pp. 219-297, pls. iv-ix. [Oiseaux, pp. 226-297, pls. iv-ix.]

A very interesting paper, and important as discussing not only the validity of various species, but also their distribution in the above Archi-

pelago and elsewhere. A table of the species, arranged according to the districts of which they are natives, is given at the end. [See *Campophagide*, *Meliphagide*, *Muscicapide*, *Nectariniide*, *Ploceide*, *Pycnonotide*, *Turdide*, *Falconide*, *Rallide*, *Charadriide*.]

MOJSISOVICS, A. V. Zoogeographische Notizen über Süd-Ungarn am dem Jahren 1886-1888. Zugleich ein iii. Nachtrag zur "Fauna von Bélye und Dárda." MT. Ver. Steierm. 1888, pp. 233-269.

Almost entirely on Birds. [Cf. Zool. Rec. xxiii, *Aves*, p. 26.]

MONTLEZUN [COMTE DE]. [See *Anatide*.]

MUIRHEAD, G. The Birds of Berwickshire, with remarks on their Local Distribution, Migration, and Habits, and also on the Folk-Lore. Proverbs, Popular Rhymes, and Sayings connected with them. Vol. I. Edinburgh: 1880, 8vo, xxvi & 334 pp., 4 full-page illustr. 76 cuts and vignettes, map.

A work on the Birds of a district of which the ornithology, as a whole, was little known. Many of the vignettes are of nests. There are three indices—that of the names of Birds being for Latin, English, and local appellations, while the second is of proverbs, &c., and the third topographical.

MURRAY, J. A. The Avifauna of British India and its Dependencies.

A systematic account, with descriptions of all the known species of Birds inhabiting British India, observations on their habits, nidification, &c.; tables of their geographical distribution in Persia, Beloochistan, Afghanistan, Sind, Punjab, N.W. Provinces and the Peninsula of India generally; with woodcuts, lithographs, and coloured illustrations. London and Bombay: 1887-89, 8vo, vol. i, viii, xxiv, & 325 pp.; vol. ii, pts. i-iii, 496 pp. [Pt. 4 (1890), concludes the work.]

A compilation from many sources. The plates will be found under the several families.

— The Edible and Game Birds of British India, with its Dependencies and Ceylon; with woodcuts, lithographs, and coloured illustrations. London and Bombay: 1889, sm. 4to, 8, xi, & 237 pp.

°NAUMANN, K. Unsere Vogelwelt im Kampfe um das Dasein. Ein ernstes Mahnwort an alle Vogelfreunde, Forst- und Landwirthe. Ilmenau & Leipzig: 1889, 8vo.

NELSON, T. H. Ornithological Notes from Redcar and Tees Mouth for 1887 and 1888. Naturalist, 1889, pp. 81-86.

NEWNHAM, A. T. H. Notes on Birds of Quetta. J. Bomb. N. H. Soc. iv, pp. 52-55.

NEWTON, A. Letter concerning the use of Fore-Limbs in progression by *Podicipes*. Ibis, 1889, p. 577. [See *Opisthocomide*.]

— [See also *Pteroclide*, *Rallide*, *Cariamide*, and HOWORTH, H. H. MACPHERSON, H. A.]

NEWTON, F. T. [See *Formicæ* *edix incerta*.]

NICHOLL, D. S. W. Notes on the Rarer Birds of Glamorganshire. Zool. 1889, pp. 166-172.

NICHOLSON, F. Sundevall's Tentamen [Methodi Naturalis Avium dispenendarum Tentamen]. Translated into English, with notes. London: 1889, 8vo, xiii & 316 pp., 2 pls.

Appendix I (pp. 307 & 308) is a reprint of a summary of Sundevall's system by R. B. Sharpe [cf. Zool. Rec. ix, *Aves*, p. 21]. Appendix II (pp. 309-316) contains outlines of arrangements of Diurnal *Accipitres* and Thrushes from two Supplements which Sundevall himself issued.

NICHOLSON, H. A., & LYDEKKER, R. A Manual of Palæontology for the use of Students, with a general introduction on the principles of Palæontology. 3rd ed., rewritten and greatly enlarged. Edinburgh & London: 1889, 8vo, vol. i, pp. i-xviii & 1-886, vol. ii, pp. i-xi & 1-887, 1419 cuts in all.

LYDEKKER has contributed all the palæontology of *Vertebrata*, that of *Aves* being contained in pp. 1208-1244, with the literature of the subject.

NIKOLSKI, A. M. Ostrov Sakhalin i ego Fauna pozvonochnykh zhivotnykh. [The Fauna of the Saghalin Island.] St. Petersburg: 1889, 8vo, xxv & 334 pp.

—. On nyekotornykh yavleniyakh vuitzyetaniya naruzhnykh pokrovov ptits i zveri. [On some phenomena of fading of external protections of Birds and Beasts.] Trudui St. Petersburg Nat. xvi [1885], p. 545.

NINNI, A. P. [See *Paridæ*.]

NORTH, A. J. Notes on Oology in 'Lord Howe Island.' Pp. 43-48. [See ETHERIDGE, R., JUN., & RAMSAY, E. P.]

The species concerned are *Halcyon vagans*, *Aplonis fuscus*, *Phaethon rubricauda*, *Sula cyanops*, *Chalcophaps chrysochlora*, and various members of the *Sterninæ* and *Procellariidæ*. Figures are given in pl. i of the eggs of the first four, with those of *Anous cinereus*, *A. stolidus*, and *Sterna fuliginosa*.

OATES, E. W. The Nests and Eggs of Indian Birds. By ALLAN O. HUME. Second Edition. Vol. I. London: 1889, 8vo, x & 397 pp., 4 pls. (portraits of Indian ornithologists).

See next work.

—. The Fauna of British India, including Ceylon and Burma. Published under the authority of the Secretary of State for India and the Colonies. Edited by W. T. BLANFORD. Birds. Vol. I. London: 1889, 8vo, xx & 556 pp., cuts [heads of many species].

The author of this work has taken the opportunity of revising the classification of *Passeres*, while following Seebohm's ideas with regard to the larger groups. He divides Passerine Birds, as usual, into *Acromyodi* and *Mesomyodi*, and within the first of these he sets apart *Alaudidæ* and *Diacidæ* before separating the remainder into nine-primaried and ten-primaried families. In the ten-primaried section he first drafts off *Nec-*

tariniidæ and *Ploceidæ* as especially distinct, and then differentiates the residue according to five types of nestling plumage. *Eurylamidæ* is raised to an order; *Eulabetidæ* is a new family, to contain *Eulabes* and *Calornis*; *Regulidæ* is separated from *Sylviidæ*; *Laniidæ* contains *Artaminiæ*, and *Corvidæ* embraces *Parina* and *Paradozornithinæ*; *Crateropodidæ* is substituted for both *Timeliidæ* and *Pycnonotidæ*, and includes *Leptoparia*, *Zosterops*, &c.; while *Sylviidæ*, on the other hand, is presented with *Cisticola* and its allies. Keys are given to both genera and species: and many of both that are new will be found under the families. A very good review is contained in 'The Field' of March 15th and of April 12th. 1890, by R. B. SHARPE, who proposes there an alternative and somewhat different classification of *Oscines*, as below. The numbers on the left shew Oates' arrangement, those on the right that of Sharpe, the later including families not Indian.

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|---------------------------------------|---|--------------------------|-----|
| 1. <i>Corvidæ</i> + <i>Paridæ</i> . | 1. 21. | 17. <i>Fringillidæ</i> . | 13. |
| 2. <i>Crateropodidæ</i> { | <i>Timeliidæ</i> + <i>Pycnonotidæ</i> } | 18. <i>Motacillidæ</i> . | 15. |
| | 31. 32. | 19. <i>Alaudidæ</i> . | 14. |
| 3. <i>Sittidæ</i> . | | 20. <i>Dicoidæ</i> . | 20. |
| 4. <i>Dicruridæ</i> . | 7. | 21. <i>Pittidæ</i> . | |
| 5. <i>Certhiidæ</i> . | 17. | — <i>Icteridæ</i> . | 9. |
| 6. <i>Regulidæ</i> . | 22. | — <i>Tanagridæ</i> . | 11. |
| 7. <i>Sylviidæ</i> . | 26. | — <i>Cerebidæ</i> . | 12. |
| 8. <i>Laniidæ</i> + <i>Artamidæ</i> . | 23. 6. | — <i>Mniotiltidæ</i> . | 16. |
| 9. <i>Oriolidæ</i> . | 8. | — <i>Meliphagidæ</i> . | 18. |
| 10. <i>Eulabetidæ</i> . | 5. | — <i>Ampelidæ</i> . | 24. |
| 11. <i>Sturnidæ</i> . | 4. | — <i>Vireonidæ</i> . | 25. |
| 12. <i>Muscicapidæ</i> . | 34. | — <i>Cinclidæ</i> . | 28. |
| 13. <i>Turdidæ</i> . | 27. | — <i>Troglodytidæ</i> . | 29. |
| 14. <i>Ploceidæ</i> . | 10. | — <i>Accentoridæ</i> . | 30. |
| 15. <i>Nectariniidæ</i> . | 19. | — <i>Campophagidæ</i> . | 33. |
| 16. <i>Hirundinidæ</i> . | 35. | | |

— [See also SHUFFELDT, R. W., and *Cuculidæ*]

OATES, C. G. Matabele Land and the Victoria Falls. A Naturalist's Wanderings in the Interior of South Africa. From the Letters and Journals of the late Frank Oates, F.R.G.S. 2nd ed. London: 1889, 8vo, xlix & 433 pp., 62 illustr., 4 maps.

R. B. SHARPE has written a new article on Ornithology in the Appendix (pp. 298-335, pls. i-ii), classifying the birds afresh and bringing the nomenclature up to date. [See *Laniidæ*, *Sylviidæ*.]

Ogilvie-Grant, W. R. Third Contribution to the List of Birds collected by Mr. C. M. Woodford in the Solomon Archipelago. Ann. N. H. (6) iv [1889], p. 320. [See *Rallidæ*, and cf. Zool. Rec. xxv. *Aves*, p. 29.]

— [See also *Plataleidæ*, *Phasianidæ*, *Turnicidæ*.]

OLIVER, J. E. The Soaring of Birds. Science, 1889, pp. 15-16. [See BAINES, A. C., CATCHPOOL, E., COURTENAY, R., FROUDE, R. E., KENI, W., MACGREGOR, J. G., PEALE, S. E., RAYLEIGH (LORD)]

OLPHE-GAILLIARD, L. Contributions à la Faune Ornithologique de l'Europe Occidentale. Lyon & Berlin : 1889, 8vo. Pt. xii, 51 pp. [*Grallæ natatores*, *Grallæ longipennes*, *Recurvirostridæ*, *Himantopodidæ*, *Hæmatopodidæ*, *Arenariidæ*], pt. xvii, 62 pp. [*Vulturidæ*], pt. xviii, 71 pp. [*Aquilidæ*], pt. xix, 96 pp. [*Circætidæ*, *Falconidæ*], pt. xx, 69 pp. [*Pernidæ*, *Milvidæ*, *Accipitridæ*, *Circidæ*], pt. xxi, 88 pp. [*Accipitres nocturni*]. [Cf. Zool. Rec. xxv, *Aves*, p. 29.]

OTTO, H. A Pusztaí Talpas-tyúk és a Madárvonulás. Termes Közlöny, 1889, pp. 18-21.

—. A Madarak Megfigyeléséről. T. c. pp. 199-206.

—. A Czerkó mint Saakapusztító. T. c. pp. 380-382.

—. Az Északi sarkkör Madárelétéből. Potfűz. Termes Közlöny : pp. 1-20, 2 cuts.

OUSTALET, E. Note sur la Faune Ornithologique des îles Mariannes. [See *Cleptornis*, n. g. (*Meliphagidæ*).]

—. [See also MILNE-EDWARDS, A., and *Picidæ*.]

PALMÉN, J. A. Internationelt ornitologiskt Samarbete och Finlands andel deri. Ett upprop till Kännarene af Finlands Foglar. Med. Soc. Fenn. xi [1885], pp. 175-220.

At p. 212, the pagination ceases, and the title thenceforward is "Förteckning öfver Finlands foglar enligt 'Suomen luurankoiset' af A. J. Mela." It is a list of 273 species, with native names, &c.

PALUMBO, A. Note di Zoologia e Botanica. Sulla plaga Selinuntina. Uccelli. Nat. Sicil. ix, pp. 19-24 & 49-51.

PARKER, W. K. [See *Cypselidæ*, *Steatornithidæ*, *Phænicopteridæ*.]

*PARSEVAL, A. v. Die Mechanik des Vogelfluga. Wiesbaden : 1889, 8vo, vii & 138 pp., 3 pls., 6 cuts.

PEALE, S. E. Sailing Flight of Large Birds over Land. Nature, xl [1889], pp. 518 & 519. [See BAINES, A. C., CATCHPOOL, E., COURTENAY, R., FROUDE, R. E., KENT, W., MACGREGOR, J. G., OLIVER, J. E., RAYLEIGH (LORD).]

PECK, J. I. Variation of the Spinal Nerves in the Caudal Region of the Domestic Pigeon. J. Morph. iii, pp. 127-136, pl. viii.

Abstract of the same ; J. Hopk. Univ. Circ. 72 [1889], p. 63.

PEMROV, A. E. Materialui dlya spiska ptitz Novgorodskoi gubernii. [Materials for a List of Birds of Novgorod Government.] Trudui St. Petersburg Nat. xvi [1885], pp. 505-528.

*PETITCLERC, P. Contributions à l'histoire naturelle de la Haute Saône. Notes d'Ornithologie suivies d'un catalogue des Oiseaux observés dans le département de 1840 à 1888 inclusive. Vésoul : 1889, 8vo, 93 pp.

PETRONE, L. M. Istologia del Sangue, del Midollo osseo, rosso, e della Polpa splenica del Piccione e del Pollo. Anat. Anz. iv, pp. 661-671.

PICKERING J. W. [See SHORE, T. W.]

PILLIET, A. Note sur la glande sébacée des Oiseaux et sur le type glandulaire dans cette classe de Vertébrés. *Bull. Soc. Z. Fr.* xiv [1889], pp. 115-122.

PINDAR, L. O. List of the Birds of Fulton County, Kentucky. *Auk*, 1889, pp. 310-316.

PLESKE, T. Ornithographia Rossica. Die Vogelfauna der Russischen Reichs. Bd. II, Lief i & ii, Grasmücken (*Sylvia*), Laubsänger (*Phylloscopus*), pp. 1-14, i-xviii, & 1-320, 6 cuts, pls. i & ii.

— Nauchnuie Rezultatui putešbestviĭ N. M. Przheval'skagho po tzentral'noi Azii. (Wissenschaftliche Resultate der von N. M. Przewalski nach Central-Asien unternommenen Reisen.) St. Petersburg : 1889, 4to, pp. 1-80, pls. i & iii. Zoological Portion. Vol. II. *Aves*, pt. i. PASSERES (*Turdidae*, *Cinclidæ*, *Sylviidae*). [See *Sylviidae*.]

POULTON, E. B. [See BUTLER, A. G.]

PŘIBYL, L. Auf welche Art und Weise, und mit Anwendung welcher Mittel wäre Aussicht vorhanden, die Landwirthe für die Geflügelzucht zu gewinnen? *MT. orn. Ver. Wien*, 1889, pp. 152-156, 167-172, 183, & 184.

PRZEVALSKI, N. M. [See PLESKE, T.]

PUTELLI, F. Ueber das Verhalten der Zellen der Riechschleimhaut bei Hühnerembryonen früher Stadien. *MT. embr. Inst. Wien*, 1889, pp. 26-29.

QUELCH, J. J. Additions to the Guiana Fauna. *Timehri*, iii, p. 166.

Culhantes urubitinga, *Querquedula cyanoptera*, *Erismatura dominica*, *Porzana flaviventris*.

RABÉ, F. Observations sur le passage des Oiseaux dans le Département de l'Yonne. *Bull. Soc. Yonne*, 1889, *Sci. Nat.*, pp. 61-68.

RADDE, G. Erwiderung auf Herrn Prof. M. N. Bogdanow's (+) Kritik der Ornith. Caucasica. *Ornis*, v [1889], pp. 336-340.

— & WALTER, A. Die Vögel Transcaspiens. Wissenschaftliche Ergebnisse der im Jahre 1886 in Transcaspien von Dr. G. Radde, Dr. A. Walter, und A. Konschin ausgeführten Expedition. *T. c.* pp. 1-128 & 165-279, map. [*Cf. Zool. Rec.* xxi-xxv, esp. xxiii. *Aves*, p. 42.]

The first portion comprises a list of species, with good field notes on the habits and nesting; the second is concerned with their distribution, breeding quarters, and migration, many tables of results being added and comparisons made with the works of other authors. [See *Fringillidae*, *Phasianidae*.]

RAMÓN Y CAJAL, S. Sur la Morphologie et les Connexions des Éléments de la Rétine des Oiseaux. *Anat. Anz.* iv, pp. 111-121, 4 cuts.

RANVIER, L. Sur les Tendons des Doigts chez les Oiseaux. I. Des plaques chondroïdes des Tendons des Oiseaux. II. Des organes céphaloïdes des Tendons des Oiseaux. *J. Microgr.* 1889, pp. 167-171. Also in *C.R.* cviii [1889], pp. 433-435 & 480-482.

RASPAIL, X. [See *Cuculidæ*.]

RAYLEIGH [LORD]. The Sailing Flight of the Albatross. *Nature*, xl [1889], p. 34. [See BAINES, A. C., CATCHPOOL, E., COURTENAY, R., FROUDE, R. E., KENT, W., MACGREGOR, J. G., OLIVER, J. E., PEALE, S. E.]

REICHENOW, A. Ueber eine Vogelsammlung aus Ostafrika. *J. f. O.* 1889, pp. 264-286.

Dr. F. Stuhlmann had sent a collection of 800 specimens from Zanzibar, Dutch East Africa, and Quilimane (Mosambique), which embraced 171 species. An account of these, with native names, is given by the writer, and especial interest attaches to their distribution. [See *Hirundinidæ*, *Motacillidæ*, *Ploceidæ*, *Indicatoridæ*, *Phasianidæ*, *Charadriidæ*.]

— Revision der wissenschaftlichen Nomenclatur der Vögel Deutschlands. *T. c.* pp. 186-188 & 341-344. [See *Cinclidæ*, *Fringillidæ*, *Hirundinidæ*, *Sylviidæ*, *Picidæ*, *Strigæ*, *Falconidæ*, *Scolopacidæ*, *Laridæ*, *Colymbidæ*, *Podicipedidæ*, *Alcidæ*.]

— Systematisches Verzeichniss der Vögel Deutschlands und des angrenzenden Mittel-Europas. Berlin: 1889, 8vo, iv & 68 pp.

— [See also *Corvidæ*, *Psittaci*.]

REID, E. W. Inclusion of the Foot in the Abdominal Cavity of a Duckling. *Nature*, xl [1889], pp. 54 & 55.

REISCHEK, A. Notes on the Islands to the South of New Zealand. *Tr. N. Z. Inst.* xxi [1889], pp. 378-389. [See *Motacillidæ*, *Psittaci*.]

REISER, O. [See *Turdidæ*.]

REITTERER, E. Des Phanères chez les Vertébrés et de leur Tissus Producteurs. *Bibl. haut. études*, xxxiii [1887], 157 pp.

A considerable proportion of this paper refers to Birds.

RHOADS, S. N. The Mimetic Origin and Development of Bird Language. *Am. Nat.* 1889, pp. 91-102.

RICHTER, W. Ueber die Anatomie und Aetiologie der Spina bifida des Hühnchens. *SB. Ges. Würzb.* 1889, pp. 45-60.

RIDGWAY, R. Notes on Costa Rican Birds, with Descriptions of seven new Species and Subspecies, and one new Genus. *P. U. S. Nat. Mus.* xi [1888], pp. 537-546. [See *Mniotiltidæ*, *Troglodytidæ*, *Turdidæ*, *Dendrocolaptidæ*, *Picidæ*.]

— Scientific Results of Explorations by the U. S. Fish Commission Steamer 'Albatross.'

I. Birds collected on the Galapagos Islands in 1888. *Op. cit.* xii [1889], pp. 101-128.

The vessel visited two islands, upon which no collections had ever previously been made, besides re-investigating the fauna of the rest, several new species being thereby procured. Lists of Birds inhabiting each island are given, and new localities stated for species already known, with further details. [See *Carebidæ*, *Fringillidæ*, *Turdidæ*, *Tyrannidæ*, *Cuculidæ*, *Sulidæ*, *Anatidæ*.]

II. Birds collected on the Island of Santa Lucia, West Indies, Abrolhos Islands, Brazil, and at the Straits of Magellan in 1887-88. *T. c.* pp. 129-139. [See *Cerebida*, *Dendrocolaptida*, *Phalacrocoracida*.]

— [See also for important articles, *Dendrocolaptida*; and cf. SALVIN, O.]

RIESENTHAL, O. V. Die Kennzeichen der Vögel Mitteleuropas und angrenzenden Gebiete. II. Die Kennzeichen unserer Wasservögel (Sumpf- und Schwimmvögel), nebst kurzer Anleitung zur Jagd. Berlin : 1889, 8vo, 158 pp., 4 pls. [Cf. *Zool. Rec.* **xxi**, *Aves.* p. 27.]

RIVES, W. C. [JUN.]. Notes on the Birds of White Top Mountain, Virginia. *Auk*, 1889, pp. 50-53.

ROCHÉ, G. Appareil pour injecter les Poumons et les Sacs Aériens des Oiseaux. *Bull. Soc. Philom.* 1889, pp. 90-92. [See also *Plataleide*, *Struthionide*.]

ROGERON, G. [See *Anatida*.]

ROOPER, G. Birds : their Nests and Habits. *Tr. Hertf. Soc.* 1889, pp. 97-106.

RUDOLF [THE LATE CROWN PRINCE OF AUSTRIA]. Notes on Sport and Ornithology. Translated by C. G. DANFORD. London : 1889, sm. 8vo, 8 & 648 pp., 1 pl.

An interesting work, of which the title well shows the scope, by an enthusiastic lover of both subjects.

RUHSAM, J. Vogel-fauna der Umgegend Annabergs. *JB. Annab. Ver.* 1885-88, pp. 102-139.

SACHSE, W. Das Vogelleben auf Grande-Conetable. *Monatschr. Schutz Vogelw.* 1889, pp. 154-157.

ST. JOHN, O. B. On the Birds of Southern Afghanistan and Kelât. *Ibis*, 1889, pp. 145-180.

The district of which this paper treats includes the Afghan Province of Kandahar, the British Provinces of Pishin and Thal Chotiali, with those of Quetta and Kelât. It will assist to clear up the range of many species, at present somewhat doubtful. [Cf. AITCHISON, J. E. T.]

SALVADORI, T. Viaggio di Leonardo Fea in Birmania e regioni vicine. **xiv**. Uccelli Raccolti nei Monti Carin a Nord-Est di Tounghoo nel Pegà presso Rangoon e Tounghoo e nel Tenasserim presso Maleewoon. *Ann. Mus. Genov.* **xxvii** [1889], pp. 369-436. Appendix [of 4 species to be added to former list for Upper Burmah, cf. *Zool. Rec.* **xxiv**, *Aves.* p. 28]. pp. 437 & 438.

The 165 species recognized by Fea in the district of the Carin Mts. [*Anglicè*, *parum rectè*, Karennee], prove to be of the greatest interest, no less than 8 being new to science, while 5 more are new to the district, and show an extension of range. [See *Meliphagida*, *Muscicapida*, *Troglodida*, *Turdida*, *Cypselida*.]

[SALVADORI, T.] Aggiunte alla Ornitologia della Papuasias e delle Molucche. Parte Prima. *Accipitres, Psittaci, Picarie*. Mem. Acc. Tor. xl, pp. 1-56.

The preface, containing some important notes on synonymy, is followed by a bibliography for the years 1881-1889, of works on the Papuan sub-region. Many new species are added to those in the former work. [See *Alcedinidæ, Cuculidæ, Falconidæ*.]

—. [On p. 36 of Zool. Rec. xxv, *Aves* (l. 21, end), add:—"But the latter includes all the Vertebrates, and not Birds only; also an alphabetical Index of all the species figured in Bonaparte's work."]

—. [See also *Hirundinidæ, Pteroclidæ, Scolopacidæ*.]

—, & GIGLIOLI, E. H. Uccelli raccolti durante il Viaggio della Corvetta 'Vettor Pisani' negli anni 1879, 1880, e 1881. Mem. Acc. Tor. xxxix, pp. 99-143.

During the above years H.R.H. Prince Thomas, Duke of Genoa, made a journey to Japan and China, touching at Somali-Land, the Maldive Is., Pulo-Penang, Singapore, the Vladivostok district, Manila, Corea, Bangkok, and the Straits of Malacca, either in going or returning. His researches extend the range of many species, and are of considerable interest. The total number of species found was 168 some of which were undescribed at the time they were discovered by the Prince. [See *Pycnonotidæ, Timeliidæ, Anatidæ, Charadriidæ, Laridæ, Alcidæ*; and cf. Zool. Rec. xxv, *Aves*, p. 31, *sub nom.* PICAGLIA, L.]

SALVIN, O. A List of the Birds of the Islands of the Coast of Yucatan and of the Bay of Honduras. Ibis, 1889, pp. 359-379. [Cf. Zool. Rec. xxv, *Aves*, p. 36.]

Many valuable notes on the synonymy are given, referring especially to species or subspecies described by Ridgway. [See also *Picidæ*.]

—. [See also GODMAN, F. D.]

—, & GODMAN, F. D. Notes on Mexican Birds. Ibis, 1889, pp. 232-243 & 380-382.

An important paper, dealing with the range of many Birds collected by Godman and his assistants. Several species are described as new, and the faunal boundaries of the region concerned are greatly elucidated. [See *Fringillidæ, Mniotiltidæ, Tanagridæ, Troglodytidæ, Turdidæ, Picidæ, Trochilidæ, Psittaci, Tetraonidæ*.]

SAUNDERS, H. An Illustrated Manual of British Birds. Pts. x-xx. London: 1889, 8vo, pp. 361-754 & i-xl (Preface and Introduction), Errata, Appendix, Index, 3 maps, cuts. [Cf. Zool. Rec. xxv, *Aves*, p. 37.]

The final portion of this work is no whit behind the former, and contains much extra information in the appendix. In the introduction the genera are characterized, and in the index different type is used for the various classes of names—a great advantage. The maps are of the United Kingdom, Europe, and the North Polar district, while a new woodcut of the Great Auk replaces that in 'Yarrell.' The Kill-deer and Sociable Plovers, the Mediterranean Black-headed Gull, the Solitary

Sandpiper, the Lesser Golden Plover, the White-billed Northern Diver, and American Green-winged and Blue-winged Teals are recognized as British Birds, and the first three are figured. The Canada, Egyptian, and Spur-winged Geese, the Polish Swan, and the Spotted Sandpiper are barely mentioned, while one of Yarrell's two figures of the Whooper is omitted, and his English names are slightly altered.

SAVATIER, A. [THE LATE]. *Histoire des Oiseaux du Département de la Charente-inférieure et des Départements limitrophes.* Ann. Soc. Char. xxv [1889], pp. 99-331.

A long account of the resident species, with field notes on the majority.

SAVILLE-KENT, W. H. Preliminary Observations on a Natural History Collection made in Connection with the Surveying Cruise of H.M.S. 'Myrmidon' at Port Darwin and Cambridge Gulf—September to November, 1888. P. R. Soc. Queensl. vi [1889], pp. 219-242. [See *Laniidæ*.]

SCHÄFF, E. Parasiten in Hühnereiern. J. f. O. 1889, pp. 88 & 89.

——. [See also *Scelopacidae*, *Charadriidae*.]

SCHALOW, H. Über die Vogelwelt der Insel Rugen. T. c. pp. 78-83.

SCHARFF, R. F. [See *Pteroclidæ*.]

SCHIER, W. Verbreitung der Sänger (Cantores), Spaltschnäbler (Fimirostres), Sitzfüssler (Insessores), Krähen (Coraces), Fänger (Captores), Klettervögel (Scansores), Rauvögel (Rapaces) in Böhmen. MT. orn. Ver. Wien, 1889, pp. 134-138, 148-151, 165, 166, & 177-182 [Cf. Zool. Rec. xxv, *Aves*, p. 37.]

SCHWAPPACH, A. Jahresbericht der forstlich-phänologischen Stationen Deutschlands. I, II, III (for years 1885, 1886, 1887). Berlin: 1886, 1888, & 1889, 172, 120, & 124 pp.

In II and III. Birds and Insects (pp. 79-110 & 81-114) are separated from plants.

SCHWEDER, G. Vogelzug im Frühjahr 1888. C.B. Ver. Riga, xxi, pp. 22 & 23.

SCLATER, P. L. List of Birds collected by Mr. Ramage in Dominica, West Indies. P. Z. S. 1889, pp. 326 & 327. [See *Turdidae*.]

——. List of Birds collected by Mr. Ramage in St. Lucia, West Indies. T. c. pp. 394 & 395.

——. [See also important articles in the families *Dendrocolaptidae*, *Platyleidae*, *Aulodidae*, *Opisthocomidae*.]

——, & HUDSON, W. H. Argentine Ornithology. A Descriptive Catalogue of the Birds of the Argentine Republic. Vol. II. London: 1889, 8vo, xxiv & 251 pp., pls. xi-xx, cuts. [Cf. Zool. Rec. xxv, *Aves*, p. 38.]

The second volume of this work contains the whole of the orders, except the *Passeres*, with appendix, index, and introduction. The latter has been already noticed: the appendix contains lists of—(i) authorities to whom reference is made: (ii) the principal localities mentioned in the

text. [For plates, see *Trochilidae*, *Caprimulgidae*, *Cuculidae*, *Psittaci*, *Falconidae*, *Ardeidae*, *Anatidae*, *Rallidae*, *Tinamidae*.]

SCOTT, W. E. D. A Summary of Observations on the Birds of the Gulf Coast of Florida. *Auk*, 1889, pp. 13-18, 152-160, 245-252, & 318-326. [*Cf.* *Zool. Rec.* xxv, *Aves*, p. 38.]

— Records of Rare Birds at Key West, Florida, and Vicinity, with a Note on the Capture of a Dove new to North America. [*See Columbidae*.] *T. c.* pp. 160 & 161.

— [See also *Falconidae*, *Ardeidae*.]

SEEBOHM, H. An Attempt to Diagnose the Suborders of the Ancient Ardeino-Anserine Assemblage of Birds by the aid of Osteological Characters alone. *Ibis*, 1889, pp. 92-104.

The result of the author's investigations is to leave the present arrangement of families almost undisturbed; but he would keep the Spoonbills separate from the Heron alliance [as *Platalea*], would divide *Anseres* into *Cygnidae* and *Anatidae*, and would merge *Plotidae* in *Phalacrocoracidae*. With regard to genera, his views are not so closely in accord with the latest authorities, *e.g.*, when he makes *Baleniceps* a Stork.

— [See also *Fringillidae*.]

SENNETT, G. B. [See *Anatidae*, *Rallidae*.]

SEVERZOFF, N. A. [THE LATE]. [See MENZBIER, M.]

SHARPE, R. B. On the Ornithology of Northern Borneo. With Notes by JOHN WHITEHEAD. Pts. I, II, III, & IV. *Ibis*, 1889, pp. 63-85, 185-205, 265-283, & 409-443, pls. ii-iv, vii, viii, xii, & xiii. [*Cf.* *Zool. Rec.* xxv, *Aves*, p. 40.]

This is a series of papers to sum up the results of Whitehead's various journeys. There are many remarks on the distribution of species, and several confirmations or corrections of former identifications, by Sharpe; but, as is natural in a recapitulation, there is little novelty. A short sketch of the travels is prefixed. [*See Campophagidae*, *Corvidae*, *Dicaeidae*, *Laniidae*, *Meliphagidae*, *Motacillidae*, *Muscicapidae*, *Nectariniidae*, *Ploceidae*, *Pycnonotidae*, *Sylviidae*, *Timeliidae*, *Troglodytidae*, *Turdidae*, *Eurylæmidae*, *Pittidae*, *Striges*, *Falconidae*.]

— Birds (in 'The Zoology of the Afghan Delimitation Commission'). *Tr. L. S.* v, pp. 66-93, pls. vi & vii.

Field notes are added by J. E. T. AITCHISON [see *Corvidae*, *Fringillidae*, *Sylviidae*, *Picidae*, and ST. JOHN, O. B.]

— [See also *Fringillidae*, *Sturnidae*, *Capitonidae*, OATES, E. W., and OATES, C. G.]

—, & WYATT, C. W. A Monograph of the *Hirundinidae*, or Family of Swallows. London: 1889, 4to, pts. ix-xii, pagin. discont., 24 pls., 4 maps of distribution. [*Cf.* *Zool. Rec.* xxv, *Aves*, p. 41.]

For plates, see the family.

SHELLEY, G. E. On the Birds collected by Mr. H. C. V. Hunter, F.Z.S., in Eastern Africa. *P. Z. S.* 1889, pp. 356-372, pls. xl & xli.

The collection, consisting of specimens of 35 species, 7 of which are 1889. [VOL. XXVI.]

new, was made on the slopes of Kilimanjaro and neighbourhood, in June, July, and August, 1888. [See *Meliphagidæ*, *Muscicapidæ*, *Nectariniidæ*, *Sturnidæ*, *Sylviidæ*, *Timeliidæ*, *Trogonidæ*.]

[SHELLEY, G. E.] [See also *Capitonidæ*.]

SHORE, T. W. The Proamnion and Amnion in the Chick. *J. Anat. Phys.* xxiv, pp. 1-21, pl. i, 14 cuts.

—, & JONES, H. L. On the Structure of the Vertebrate Liver. *J. Physiol.* x [1889], pp. 408-428, pls. xxvii-xxix.

SHUFELDT, B. W. Contributions to the Comparative Osteology of the Families of North American *Passeres*. *J. Morph.* iii [1889], pp. 81-114, pls. v & vi [skulls].

The writer's object in this clear and valuable paper being to give a concise sketch of the comparative osteology of the *Passerine* families represented in North America, he takes examples of each, omitting those fully discussed in previous or simultaneous papers.

He judges of the relationships, not only by osteology, but also by the plumage of the young, size of brain, number of primaries, covering of the tarsus, and so forth, and agrees with Professor Newton in thinking *Corvidæ* the most highly developed family of *OSCINES*, while he considers *Laniidæ* the other extreme. Though the skulls of typical *CLAMATORES* afford very excellent differential characters, compared with *OSCINES*, the rest of the axial and the appendicular skeletons fail to do so. The position of *Myiadestes*, *Cinclus*, &c., are fully treated. The resulting arrangement is :—

ORDER.	SUBORDERS.	FAMILIES.
PASSERES.	CLAMATORES.	1. <i>Tyrannidæ</i> . 1.
		2. <i>Laniidæ</i> . 10.
		3. <i>Ampelidæ</i> . 9.
		4. <i>Hirundinidæ</i> . 8.
		5. <i>Alaudidæ</i> . 2.
		6. <i>Certhiidæ</i> . 17.
		7. <i>Vireonidæ</i> . 11.
		8. <i>Motacillidæ</i> . 14.
		9. <i>Sylviidæ</i> . 19.
		10. <i>Cerebidæ</i> . 12.
	OSCINES	11. <i>Mniotiltidæ</i> . 13.
		12. <i>Cinclidæ</i> . 15.
		13. <i>Troglodytidæ</i> . 16.
		14. <i>Turdidæ</i> . 20.
		15. <i>Paridæ</i> . 18.
		16. <i>Tanagridæ</i> . 7.
		17. <i>Fringillidæ</i> . 6.
		18. <i>Icteridæ</i> . 5.
		19. <i>Sturnidæ</i> . 4.
		20. <i>Corvidæ</i> . 3.

The right-hand figures shew the former position of the families in the A. O. U. Check-List. [Cf. OATES, E. W.]

- [SHUFELDT, R. W.] Notes on the Anatomy of *Speotyto cunicularia hypogaea*. T. c. pp. 115-125, pl. vii. [See *Striges*.]
- On the position of *Chamaea* in the System. T. c. pp. 475-502, 1 cut. [See *Paridæ*.]
- Osteology of *Circus hudsonius*. J. Comp. Med., April, 1889, 35 pp., 17 cuts. [See *Falconidæ*.]
- Osteological Studies of the Sub-family *Ardeinæ*. T. c. pp. 218-243, 287-317, 37 cuts. [See *Ardeidæ*.]
- Studies of the *Macrochires*, Morphological and otherwise, with the view of indicating their Relationships, and defining their several Positions in the System. J. L. S. xx, pp. 299-394, pls. xvii-xxiv. Correction of Error, Zool. 1889, p. 456.

This paper covers a much larger area than the title would imply, containing:—(1) The Morphology of *Ampelis cedrorum*; (2) The Skeleton of *Ampelis*; (3) Osteology of *Trogon mexicanus* and *T. puella*; (4) The Anatomy of certain *Caprimulgi* (on the Pterographical tracts of *Antrostomus* and *Chordeiles*, omitting the remiges and rectrices), observations on the Anatomy of *Antrostomus* apart from the Skeleton, on the mode of Insertion of the Patagial Muscles of the Pectoral Limb, of the Pectoral Muscles, Notes on the Anatomy of the Pelvic Limb, other Notes, of the Osteology; (5) Anatomy of the North-American *Hirundinidæ*; (6) On the Morphology of certain *Cypseli* and *Trochili*. The author's conclusions are that *Ampelis* (an average Oscinine Bird) presents no special affinity to the Swallows; while in some respects it links the Mesomyodian Birds with the *Oscines*, being nearer to the latter. That *Trogon mexicanus* and *T. puella* are not related to the *Trochili*, and are also far from the *Caprimulgi*, being, perhaps, more nearly allied to the Cuckoos. *Trochili*, *Cypseli*, and *Caprimulgi* must stand as orders, the latter being nearest to the Owls, while far from the second and also from the first. *Hirundinidæ* are true *Passeres*, considerably modified; while Swifts were early differentiated from the Hirundinine stock. The *Cypseli* differ utterly from the *Trochili*, and are just outside the Passerine circle.

- Contributions to the Comparative Osteology of Arctic and Sub-Arctic Water-Birds. Part II. J. Anat. Phys. xxiii, pp. 165-186, pls. vii-xi. [Cf. Zool. Rec. xxv, *Aves*, p. 42.]

This contribution treats of the osteology of *Uria*, and compares it with that of *Alca torda*, with a view to determining the relative position of the genera. The author considers: (1) The Skull; (2) The Vertebral Column; (3) The Pelvis and Coccygeal vertebræ; (4) The Pectoral Arch; (5) The Sternum; (6) The Pelvic Limb; and gives (7) Brief summary of the osteological differences between the above genera. He concludes that the arrangement of the A. O. U. Check List is quite in keeping with structural considerations, and that *Alca* is nearer to *Plautus* than to *Uria*.

- — Part III. T. c. pp. 400-427, 17 figs.

Here forms such as *Synthliboramphus*, *Brachyrhamphus*, and *Cepphus* are discussed under the heads of:—(1) Observations upon the Skeleton

of *B. marmorata*, and *S. antiquus*; (2) Remarks upon the Sternum and Pectoral Arch of *C. columba*; (3) The Skeleton of *C. grylle*; (4) Comparative Synopsis of the Osteological Characters of the three genera.

[SHUFELDT, R. W.] —. Part iv. *T. c.* pp. 537 & 538, 8 cuts.

Dissertations on:—(1) The Osteology of the Anklets (subfam. *Phalerinae* of the A. O. U. Check List); (2) The Skeleton of *Simorhynchus pusillus*; (3) The skeleton of *S. cristatellus*; (4) The Osteology of the Genus *Cyclorrhynchus*.

—. —. Part v. *Op. cit.* xxiv, pp. 89–116, pls. vi–viii.

Paragraphs on: (1) The Skeleton in the Puffins (subfam. *Fraterculinae*); (2) The remainder of the Axial Skeleton in Puffins; (3) The Appendicular Skeleton in Puffins; with (4) Analytical synopsis of the osteological characters of the North-American *Alcidae*. The author concludes that *Uria* is the highest type of the *Alcidae*, and comes nearest to *Laridae*, while *Plautus* is the lowest. The subfamily *Phalerinae* is placed rightly in the A. O. U. Check List, though it perhaps left the original stock after *Plautus* did.

—. [See also *Fringillidae*, *Phenicopteridae*.]

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SMIRNOV, A. E. O Klyetkakh Destzametovoi obolochki Roghovitzui a Ptitz. Protok. obsch. estest. Kazan, 1888–89, 4 pp.

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A list of 25 species. [See *Fringillidae*.]

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An account of collections made in Quindumbo between October and December, 1887; in Catumbella between April and June, 1888; and in

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PASSERES.

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Rhamphocorys clot-beyi, exhibition of specimen, with remarks; P. L. SCLATER, P. Z. S. 1889, pp. 26 & 27.

AMPELIDÆ.

[See SHUFFELDT, R. W.]

CAMPOPHAGIDÆ.

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Certhia brachydactyla, a cyst on the skin; S. BONJOUR, Bull. Soc. Zool. Fr. 1889, pp. 316 & 317.

Salpornis emini, Hartl., may be a subspecies of *S. salvadorii*, Barb., and be called *S. s. orientalis*; G. HARTLAUB, J. f. O. 1889, pp. 114-116. [Cf. Zool. Rec. xxv, *Aves*, p. 50.]

CHAMÆIDÆ.

Chamaea, see *Parida*.

CINCLIDÆ.

Cinclus melanogaster, synonymy; A. REICHENOW, J. f. O. 1889, pp. 341 & 342: figured, with *C. aquaticus*; LORD LILFORD, Col. Fig. Br. Birds, pt. xi.

CÆREBIDÆ.

Certhidea cinerascens, n. sp., Hood I., Galapagos; R. RIDGWAY, P. U. S. Nat. Mus. 1889 [xii], p. 105.

Certhiola godmani, *C. wellsi*, n. spp., Grenada, W. I.; C. B. CORY, Auk, 1889, p. 219. *C. finschi*, Ridg. [cf. Zool. Rec. xxi, *Aves*, p. 37] is untenable; R. RIDGWAY, P. U. S. Nat. Mus. 1889 [xii], p. 129.

Dacnis modesta, Cab., is not ♀ of *D. analis*, but of *D. angelica*; H. v. BERLEPSCH, J. f. O. 1889, p. 295.

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cornix figured ; LORD LILFORD, Col. Fig. Brit. Birds, pta. x & xi. *C. corax* in Essex, notes ; E. A. FITCH, Esa. Nat. 1889, pp. 219-221. *C. tingitanus*, its distribution in the Atlas district ; H. SCHALOW, J. f. O. 1889, pp. 331-333.

Dendrocitta cinerascens, correction of figure in pl. viii, Ibis, 1879 ; R. B. SHARPE, *op. cit.* 1889, pp. 81 & 82. *D. occipitalis*, *D. bayleyi* figured ; J. A. MURRAY, Avif. Brit. India, i, p. 132.

Garrulus glandarius figured ; LORD LILFORD, Col. Fig. Br. Birds, pt. x. *G. leucotis* figured ; J. A. MURRAY, Avif. Brit. India, i, p. 142.

Nucifraga caryocatactes, migration in Austria and Hungary in the spring of 1887, figs. of bill of *N. c. pachyrhynchus* ; V. v. TSCHERNIZ SCHMIDHOFFEN, Ornith., 1889 [v], pp. 129-148, pl. ii : other notes ; *id.*, Monatschr. Schutze Vogelw. 1889, pp. 4-14, 2 cuts. *N. c. relictæ*, n. subsp., a third form in Europe [the Alps] ; A. REICHENOW, J. f. O. 1889, pp. 287 & 288.

Pica, geographical distribution of the genus ; F. DIEDERICH, Ornith., 1889 [v], pp. 280-332. *P. leucoptera* on the Hari-rud, Afghanistan ; R. B. SHARPE, Tr. L. S. v, p. 69.

Picicorvus columbianus, its nest and eggs, &c. ; C. E. BENDIRE, Auk, 1889, pp. 226-236.

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DICÆIDÆ.

Dicæum nitidum, n. sp., Sudest I. ; H. B. TRISTRAM, Ibis, 1889, p. 555. *D. monticola*, ♀ described [cf. Zool. Rec. xxiv, *Aves*, p. 44] ; R. B. SHARPE, t. c. p. 428.

DICRURIDÆ.

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Dissomurulus, n. g. [type *Dicrurus lophorinus*, Vieill.] ; E. W. OATES, Birds of India, i, p. 322, *id.*, Hume's Nests and Eggs of Indian Birds, 2nd ed., i, p. 215.

FRINGILLIDÆ.

Amphispiza quinquestriata, from Sonora ; O. SALVIN & F. D. GODMAN, Ibis, 1889, p. 238.

Cactornis brevirostris [♂], n. sp., Chatham I., Galapagos ; *C. hypoleuca* [♂], possibly n. sp., James I., Galapagos ; R. RIDGWAY, P. U. S. Nat. Mus. 1889 [xii], pp. 108 & 109.

Camarhynchus townsendi [♂ ♀], *C. pauper* [♀], n. spp., Charles I., Galapagos; *id. t. c.* pp. 110-112.

Cardinalis phoeniceus [♂ ♀], figured; E. BARTLETT, Monogr. Weaver-Birds and Finches, pt. iv.

Chamaospiza nigrescens, Patzcuaro, Mexico, *C. alticola*, Sierra Nevada de Colima, Mexico, n. spp.; O. SALVIN & F. D. GODMAN, Ibis, 1889, p. 381.

Chlorura borneensis, n. sp. [= *C. hyperythra*, Reich., of Sharpe, Ibis, 1887, p. 453]; R. B. SHARPE, ANN. N. H. (6) iii [1889], p. 424, and Ibis, 1889, p. 435.

Chrysomitridops caeruleirostris, n. g. & sp. [♂], Kauai, Sandwich Is.; S. B. WILSON, P. Z. S. 1889, p. 445.

Coccothraustes personatus, *C. melanurus* [♂ ♀], figured; E. BARTLETT, Monogr. Weaver-Birds and Finches, pts. iii & iv. *C. vespertina* has no secondary palatine processes; R. W. SHUFELDT, Auk, 1889, p. 74.

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Erythrospiza obsoleta, notes on its nest, eggs, &c.; G. RADDE & A. WALTER, Ornith., 1889 [v], pp. 25-27.

Fringilla palmae, n. sp., I. of Palma, Canary Is.; H. B. TRISTRAM, ANN. N. H. (6) iii [1889], p. 489. Also described as *F. caerulea*; A. KÖNIG, J. f. O. 1889, p. 183. *F. maderensis* and its 3 subspecies (Zool. Rec. xxv, Aves, p. 51) must all be included under *F. tintillon*; H. B. TRISTRAM, Ibis, 1889, pp. 19 & 20. *F. teydea*, its nest and eggs; RAMON GOMEZ, *t. c.* p. 260; E. G. MEADE-WALDO, *t. c.* pp. 517-519.

Geospiza conirostris [♂ ♀], *G. media* [♂], n. spp., Hood I., Galapagos; R. RIDGWAY, P. U. S. Nat. Mus. 1889 [xii], pp. 106 & 107.

Loxia, reproduction in European species; R. KÖNIG-WARTHAUSEN, JH. Ver. Württ. 1889, pp. 241-291. *L. curvirostra*, account of breeding in co. Waterford; R. J. USSHER, Zool. 1889, pp. 180 & 181: its migration in 1888; V. v. TSCHUSI ZU SCHMIDHOFFEN, MT. orn. Ver. Wien, 1889, pp. 283 & 284: the reason of it; E. ALTUM, *t. c.* pp. 493-496. *L. pityopsittacus* at Parsonstown; A. G. MORE, *t. c.* pp. 181 & 182.

Loxops flammea, n. sp. [♂ ♀], Molokai, Sandwich Is.; S. B. WILSON, P. Z. S. 1889, pp. 445 & 446.

Melospiza fasciata rivularis, n. subsp. [♂ ♀], Comonda, Lower California; W. E. BRYANT, P. Cal. Ac. Sci. (2) i, pp. 197-200. *M. lincolni striata* [♂ ♀], n. subsp., Comox, Brit. Columbia; W. BREWSTER, Auk, 1889, pp. 89-90.

Paroaria dominicana figured; E. BARTLETT, Monogr. Weaver-Birds and Finches, pt. v.

Passer yatii [cf. Zool. Rec. xxv, Aves, p. 52] figured; R. B. SHARPE, Tr. L. S. v, p. 80, pl. vi, fig. 2.

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Zonotrichia querula, supposed nest and eggs described; C. E. BENDIRE, *z. c.* pp. 150-152.

HIRUNDINIDÆ.

The family, see SHUFELDT, R. W.

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Hirundo filifera, *H. fluvicola*, *Pityoprogne concolor*, eggs figured; H. E. BARNES, J. Bomb. N. H. Soc. iv, pp. 84, 86, & 90, pl. i.

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Psalidoprogne petiti orientalis, n. subsp. [♀], Lewa (Usambara), E. Africa; A. REICHENOW, J. f. O. 1889, p. 277.

ICTERIDÆ.

Aphobus megistus, n. sp., Vera Cruz and San Miguel, Bolivia; P. LUNN, J. f. O. 1889, pp. 104-106. The comparison with *A. chopi* 2 pages.

Cassicus pachyrhynchus, n. sp. [= *C. haemorrhous*, *Scl. & Salv.*, = *C. affinis*, *Scl.*, *Cat. Birds B. Mus.* xi] ; *C. aphanes*, n. sp. [= *C. haemorrhous* of Brazil] ; H. v. BERLEPSCH, *t. c.* pp. 299 & 300.

Trupialis militaris falklandica, n. subsp., Falkland Is. ; P. LEVERKÜHN, *t. c.* pp. 108 & 109. This specimen was bought from Jamrach, of London, for the Kiel Museum, in 1862.

LANIIDÆ.

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Hemipus picatus new to Borneo ; R. B. SHARPE, *t. c.* pp. 189 & 190.

Hyloterpe hypoxantha, ♀ described [*cf. Zool. Rec.* xxiv, *Aves*, p. 48] ; *id. t. c.* p. 419.

Laniarius zosterops, n. sp., Du Quesah River, W. Africa ; J. BÜTTIKOFER, *Notes Leyd. Mus.* xi [1889], p. 98.

Lanius ludovicianus and *L. l. excubitorides*, their breeding range ; G. H. BAGSDALE, *Auk*, 1889, pp. 224–226. *L. raddii* figured, with full description [*cf. Zool. Rec.* xxv, *Aves*, p. 55] ; H. E. DRESSER, *Ibis*, 1889, p. 89, pl. v : other notes ; G. RADDE & A. WALTER, *Ornis*, 1889 [v], pp. 64 & 65. *L. homeyeri* breeding at Nagy Enyed [Austria] ; J. v. CSATÓ, *MT. orn. Ver. Wien*, 1889, pp. 241 & 242.

Pachycephala fretorum, n. sp. [♂ ♀], Southern shores of Torres Straits ; W. H. SAVILLE-KENT, *P. R. Soc. Queensl.* vi [1889], pp. 237 & 238.

MELIPHAGIDÆ.

Cleptornis proposed as n. g. for *Ptilotis marchii*, n. sp., Marianne Is. ; E. OUSTALET, *Le Nat.* 1889, p. 260.

Hemignathus, Lichtenstein. On three undescribed species of the genus ; S. B. WILSON, *Ann. N. H.* (6) iv [1889], pp. 400–402. *H. stejnegeri*, *H. hanapepe*, n. spp., Kauai, Sandwich Is., *H. lichtensteini*, n. sp. [= *H. obscura*, Licht. (*nec* Gmel.)], Oahu, Sandwich Is. ; *H. procerus*, n. sp., Kauai, Sandwich Is. [= *H. stejnegeri*, Wilson] ; J. CABANIS, *Vossische Zeitung*, No. 429, 14 Sept., 1889, and *J. f. O.* 1889, p. 331.

Himatione montana, n. sp. [♂ ♀], Lanai, Sandwich Is. ; S. B. WILSON, *P. Z. S.* 1889, p. 446. *H. stejnegeri*, n. sp., Kauai, Sandwich Is. ; *H. chloris*, notes ; *id. ibid.*

Mysomela rubro-cucullata, n. sp., St. Aignan's, Louisiade Archipelago ; H. B. TRISTRAM, *Ibis*, 1889, p. 228.

Ptilotis, see *Cleptornis*, *supra*.

Zosterops mesoxantha, n. sp. [♂ ♀], Tahò, Burma ; T. SALVADORI, *Ann. Mus. Genov.* xxvii [1889], p. 396. *Z. perspicillata*, n. sp. [♂ ♀], Kili-

manjaro, E. Africa; G. E. SHELLEY, P. Z. S. 1889, pp. 366 & 367, pl. xh, fig. 1. *Z. simplex loochooensis*, n. subsp., Loo-choo Is.; H. B. TRISTRAM, Ibis, 1889, p. 229. *Z. angaziza* = *Z. kirki*, Shelley; figured, with *Z. mouroniensis* [cf. Zool. Rec. xxii, *Aves*, p. 40]; A. MILNE-EDWARDS & E. OUSTALET, N. Arch. Mus. (2) x, pp. 247-249, pl. v. *Z. clara*, ♂ & ♀ described [cf. Zool. Rec. xxv, *Aves*, p. 55]; R. B. SHARPE, Ibis, 1889, pp. 427 & 428.

MNIOTILTIDÆ.

Compsothlypis pulchra, n. sp. [♂ & ♀], Hacienda de San Rafael, Chihuahua, Mexico; W. BREWSTER, Auk, 1889, pp. 93 & 94.

Dendreca nigrifrons, n. sp. [♂ & ♀], Sierra Madre Mts. (Pinos Altos), Chihuahua, Mexico; *id. t. c.* pp. 94-96.

Geothlypis caninucha icterotis, n. subsp. [♂], Costa Rica; R. RIDGWAY, P. U. S. Nat. Mus. 1888 [xi], pp. 539 & 540. *G. cucullata*, n. sp., Mexico, Jalapa, Cofre de Perote; O. SALVIN & F. D. GODMAN, Ibis, 1889, p. 237. *G. trichas roscoe* (Audub.) reinstated; E. M. HASSBROUCK, Auk, 1889, pp. 167 & 168.

Helinæa swainsoni, new to Mexico; O. SALVIN & F. D. GODMAN, Ibis, 1889, p. 236.

Helminthophila crissalis, n. sp., Sierra Nevada de Colima, Mexico; *id. t. c.* pp. 380 & 381. *H. pinus* and its allies; E. H. EAMES, Auk, 1889, pp. 305-310.

Oporornis agilis new to S. America (Brazil); H. v. BERLEPSCH, J. f. O. 1889, p. 98.

MOTACILLIDÆ.

Anthus steindachneri, n. sp., Antipodes I.; A. REISCHEK, Tr. N. Z. Inst. xxi [1889], p. 388. *A. aquaticus* new to Askhabad district; J. STOLZMANN, Mém. Soc. Zool. Fr. iii, p. 92. *A. richardi*, *A. cerinus*, figured; LORD LILFORD, Col. Fig. Br. Birds, pts. x & xi.

Budytes campestris, new to E. Africa; A. REICHENOW, J. f. O. 1889, p. 284: new to Askhabad district; J. STOLZMANN, Mém. Soc. Zool. Fr. iii, p. 92.

Henicurus borneensis, n. sp., Kina Balu, N. Borneo; R. B. SHARPE, Ibis, 1889, pp. 277 & 278.

MUSCICAPIDÆ.

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Cryptolopha, see *Sylviidæ*.

Cyornis dialilema, n. sp. [♂], Tahò, Burma; T. SALVADORI, Ann. Mus. Genov. xxvii [1889], p. 387.

Digenia leucomelanura, *D. moniliger*, figured; J. A. MURRAY, Avif. Brit. India, i, p. 228.

Hemichelidon cinereiceps figured, ♀ described [cf. Zool. Rec. xxiv, *Aves*, p. 50]; R. B. SHARPE, Ibis, 1889, p. 194, pl. vii, fig. 1.

Humblotia flavirostris [cf. Zool. Rec. xxii, *Aves*, p. 41], figured; A. MILNE-EDWARDS & E. OUSTALET, N. Arch. Mus. (2) x, pp. 261-263, pl. viii.

Hypothymis azurea, nest figured; H. E. BARNES, J. Bomb. N. H. Soc. iv, pl. ii.

Muscicapa parva, in Sweden, from 1855-1888; C. R. SUNDSTRÖM, Orn. 1889 [v], pp. 156-164 & 341: other notes; BRUATZ, Zeitschr. f. Orn. u. prak. Gefl. 1889, pp. 113-117; H. W. DE GRAAF, Tijdschr. Nederl. Dierk. Ver. (2) ii, pp. 158-161.

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Pachyrhiza mixta, n. sp. [♂ ♀], Kilimanjaro, E. Africa; G. E. SHELLEY, P. Z. S. 1889, pp. 359 & 360, pl. xl.

Rhinomyias gularis figured, with note on ♀; R. B. SHARPE, Ibis, 1889, pp. 201 & 202, pl. vii, fig. 2.

Rhipidura fuliginosa in North I., New Zealand; T. W. KIRK, Ibis, 1889, pp. 296 & 297.

Stoparola cerviniventris, ♀ described [cf. Zool. Rec. xxiv, *Aves*, p. 50]; R. B. SHARPE, Ibis, 1889, p. 204.

Terpsiphone comorensis [cf. Zool. Rec. xxii, *Aves*, p. 41] figured; it should stand as *T. mutata* var. *comorensis*; A. MILNE-EDWARDS & E. OUSTALET, N. Arch. Mus. (2) x, pp. 265 & 266, pl. viii.

Xanthopygia narcissina new to Borneo; R. B. SHARPE, Ibis, 1889, p. 196.

NECTARINIIDÆ.

Æthopyga temminckii, ♀ described; R. B. SHARPE, Ibis, 1889, pp. 421 & 422. *Æ. seheria*, *Æ. nipalensis*, figured; J. A. MURRAY, Avif. Brit. India, ii, p. 222, pl. i, figs. 1-3.

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Arachnothera julia, ♀ described; R. B. SHARPE, Ibis, 1889, p. 424 [cf. Zool. Rec. xxiv, *Aves*, p. 50].

Cinnyris castaneiventris, n. sp. [♂], Yoruba, Northern W. Africa; J. v. MADARASZ, Orn. 1889 [v], p. 149, pl. iii. *C. christiana*, n. sp., St. Aignan's I.; H. B. TRISTRAM, Ibis, 1889, pp. 555 & 556. *C. hunteri*, n. sp. [♂ ♀], Useri R., E. Africa; G. E. SHELLEY, P. Z. S. 1889, p. 365, pl. xli, fig. 2. *C. humbloti* figured [cf. Zool. Rec. xxii, *Aves*, p. 42]; A. MILNE-EDWARDS & E. OUSTALET, N. Arch. Mus. (2) x, pp. 245 & 246, pl. iv. *C. minimus*, *C. brevirostris*, figured; J. A. MURRAY, Avif. Brit. India, ii, pp. 228 & 230.

Nectarinia thomensis, n. sp., S. Thomé; J. v. BARBOZA DU BOCAGE, J. Sci. Liab. (2) i, pp. 143 & 144.

STURNIDÆ.

Agropsar, n. g. [type *Sturnia sturnina* (Pall.)]; E. W. OATES, Birds of India, p. 530.

Fregilupus varius, notes; R. B. SHARPE, Nature, xl [1889], p. 177.

[*Haplomis fuscus*, egg figured; A. J. NORTH, Oology of Lord Howe I., pl. i.

Pastor roseus in numbers, near Sofia, Bulgaria (from information of Prince Ferdinand); A. B. MEYER, Circ. des Zool. Mus. zu Dresden, 12th of June, 1889. A general account of its occurrence and breeding in Europe up to 1889; A. B. MEYER & F. HELM, iv Jahresb. Beobacht. Sachs. pp. 136-147.

Pholidauges fischeri, ♂ new to science; G. E. SHELLEY, P. Z. S. 1889, p. 368.

Poliopsar fuscogularis, n. sp. [♂], Chiallà, Karen Mts., Burma: T. SALVADORI, Ann. Mus. Genov. xxvii [1889], pp. 364, 421, & 422.

Spodiopsar, n. g., for *Poliopsar* (pre-occupied) [cf. Zool. Rec. xiv, Aves, p. 59]; R. B. SHARPE, Ibis, 1889, p. 580.

SYLVIIDÆ.

DOMBROWSKI, R. v. Das Brutgeschäft der in Niederösterreich brütenden Rohrsänger. MT. orn. Ver. Wien, 1889, pp. 409-418, 421-423, & 433-436.

Acanthiza squamata, n. sp. [♂ ♀], Herberton, Queensland; C. W. DE VIE, P. R. Soc. Queensl. vi [1889], pp. 248 & 249.

Acanthopneuste davisoni, n. sp. [= *Reguloides viridipennis* (? Blyth)], Mt. Muleyit, Tenasserim, Karen Hills, Karen-nee, Manipur; E. W. OATES, Birds of India, i, p. 420, *id.*, Hume's Nests and Eggs of Indian Birds, ed. 2, i, p. 269.

Ædon galactodes figured; LORD LILFORD, Col. Fig. Br. Birds, pt. x.

Arundinar ædon [♂] figured; T. PLESKE, Wiss. Result. Przewalski Reisen, pl. iii, fig. 1.

Calliope tschebaiewi [♂ ♀] figured; *id. t. c.* pp. 73-75, pl. i, figs. 3 & 4.

Cryptolopha montis, ♀ described [cf. Zool. Rec. xxiv, Aves, p. 54], and figured with *C. schwaneri*; R. B. SHARPE, Ibis, 1889, pp. 203 & 204, pl. viii, figs. 1 & 2.

Dumeticola major [♂] figured; T. PLESKE, Wiss. Result. Przewalski Reisen, pl. i, fig. 5.

Erithacus superbis, n. sp., Teneriffe; A. KÖNIG, J. f. O. 1889, p. 183.

Herbirocula armandi [♂], *H. indica* [♂], *H. fuscata* [♂], *H. ...* [♂] figured; T. PLESKE, Wiss. Result. Przewalski Reisen, pl. iii, figs. 2-5.

Hypolaus ietecina, synonymy; A. REICHENOW, J. f. O. 1889, pp. 186 & 187.

Locustella pleskii [♂], n. sp. [= *L. fasciolata*, Tacz., P. Z. S. 1888,

p. 445], Tchimulpo and Seoul, Corea ; L. TACZANOWSKI, P. Z. S. 1889, pp. 620 & 621.

Phylloscopus fortunatus, n. sp., near *P. rufus*, Canaria, Teneriffe, and Gomera ; H. B. TRISTRAM, Ibis, 1889, p. 21. *P. newtoni*, n. sp. [= *P. proregulus*, pt. (India)] ; H. GÄTKE, t. c. pp. 578 & 579. *P. borealis* [♂], *P. nitidus* [♂], *P. viridanus* [♂], *P. plumbeitarsus* [♂], *P. tenellipes* [♂], *P. occipitalis* [♂ ♀] figured ; T. PLESKE, Ornithographia Rossica, pl. ii, figs. 1-7. *P. subviridis* figured ; J. A. MURRAY, Avif. Brit. India, i, p. 252.

Pinarochroa hypospodia, a second specimen ; G. E. SHELLEY, P. Z. S. 1889, p. 364.

Poliophtila nigriceps restricta, n. subsp., Southern Sonora (Alamos), Mexico ; W. BREWSTER, Auk, 1889, pp. 97 & 98. *P. boliviana*, Sch., reinstated as a good species ; P. LEVERKÜHN, J. f. O. 1889, p. 109.

Pratincola dacotia, n. sp. [♂ ♀], Fuerteventura I., Canary Is. ; E. G. MEADE-WALDO, Ann. N. H. (6) iv [1889], p. 252, and Ibis, 1889, pp. 504 & 505, pl. xvi. *P. maura przewalskii*, n. subsp., Gan-su, Russki Mts., Koria Mts. and R., Central Asia ; T. PLESKE, Wiss. Result. Przewalski Reisen, pp. 46-53. *P. insignis* [♂] figured ; *id.* t. c. pp. 43 & 44, pl. i, figs. 1 & 2. *P. salaz.* Verr., = *P. sybilla*, L., &c. ; W. STONE, P. Ac. Philad. 1889, pp. 78-80.

Regulus satelles, n. sp., Canary Is. ; A. KÖNIG, J. f. O. 1889, p. 263. *R. ignicapillus*, status as a British bird ; J. H. GURNEY, Jun., Zool. 1889, pp. 172-174.

Ruticilla tithys, another nest reported from Essex ; W. JESSE, Jun., Ess. Nat. 1889, p. 39 : figured ; M. BROWNE, Vertebrate Animals of Leicestershire, pl. i.

Saxicola chrysopygia figured ; J. A. MURRAY, Avif. Brit. India, ii, p. 6.

Sericornis gutturalis, n. sp. [♂ ♀], Herberton Scrubs, Queensland ; O. W. DE VIS, P. R. Soc. Queensl. vi [1889], p. 244.

Sylvia althea [♂ ♀], *S. curruca* [♂], *S. minuscula* [♂ ♀] figured ; T. PLESKE, Ornithographia Rossica, pl. i, figs. 1-7 : the latter figured ; J. A. MURRAY, Avif. Brit. India, i, p. 237. *S. mystacea* at Gulran, Badghis ; R. B. SHARPE, Tr. L. S. v, p. 71. *S. passerina* of Webb and Berthelot = *S. conspicillata*, and not *S. subalpina* ; H. B. TRISTRAM, Ibis, 1889, p. 24.

Thamnolæa shelleyi figured ; R. B. SHARPE, Append. to C. G. Oates' Matabele Land, Ornithology, pl. i.

TANAGRIDÆ.

Chlorospingus albifrons, n. sp., Mexico, Omilteme in Sierra Madre del Sur ; O. SALVIN & F. D. GODMAN, Ibis, 1889, pp. 237 & 238.

Euphonia godmani, n. sp. [♂], Coast region of W. Mexico (Mazatlan & Alamos) ; W. BREWSTER, Auk, 1889, pp. 91 & 92.

Procnias viridis, Ill., substituted for *P. carulea* (Vieill.) ; J. A. ALLEN, Bull. Am. Mus. Nat. Hist. ii, p. 70.

TIMELIIDE.

Alcippe kilimensis, n. sp., Kilimanjaro, E. Africa; G. E. SHELLEY, P. Z. S. 1889, p. 364. [Genus new to Africa.]

Allocotops calvus [cf. Zool. Rec. xxv, *Aves*, p. 61], ad. and juv. figured; R. B. SHARPE, Ibis, 1889, p. 413, pl. xiii.

Cisticola hunteri, n. sp., Kilimanjaro, E. Africa; G. E. SHELLEY, P. Z. S. 1889, p. 364.

Drymocataphus johnsoni, n. sp., Hill Town, Du Queah River, W. Africa; J. BÜTTIKOFER, Notes Leyd. Mus. xi [1889], pp. 97 & 98.

Garrulax perspicillatus new to Japan; T. SALVADORI & E. H. GIGLIOLI, Mem. Acc. Tor. xxxix, p. 124. *G. schistochlamys* [cf. Zool. Rec. xxv, *Aves*, p. 61], ♂ ♀ described; R. B. SHARPE, Ibis, 1889, pp. 411 & 412.

Graumatoptila austeni, n. sp. [= *G. striata* (Vigors)], the Daphla and Eastern Naga Hills; E. W. OATES, Birds of India, i, p. 104.

Hilarocichla, n. g. [type *Pteruthius ruficenter*, Blyth]; *id. t. c.* p. 243.

Lioparus, n. g. [type *Proparus chrysæus* (Hodg.)]; *id. t. c.* p. 174.

Malacias castanopterus, n. sp. [♂ ♀] Yaddò and Tahò, Carin [Karen] Mts., Burma; T. SALVADORI, Ann. Mus. Genov. xxvii [1889], pp. 363, 364, & 411.

Mixornis montana, ♂ described [cf. Zool. Rec. xxiv, *Aves*, p. 57]; R. B. SHARPE, Ibis, 1889, p. 417.

Phyllergates cinereicollis, ♂ ♀ described [cf. Zool. Rec. xxv, *Aves*, p. 62]; *id. t. c.* pp. 279 & 280.

Pomatorhinus imberbis, n. sp. [♀], Yaddò, Burma; T. SALVADORI, Ann. Mus. Genov. xxvii [1889], p. 410. *P. borneensis*, notes on eggs; E. HARTELT, J. f. O. 1889, p. 384.

Rhopocichla, n. g. [type *Alcippe atriceps* (Jerd.)]; E. W. OATES, Birds of India, i, p. 159.

Scæorhynchus, n. g. [type *Paradoxornis* (Suthora) *ruficeps*, Blyth]; *id. t. c.* p. 68, and Hume's Nests and Eggs of Indian Birds, 2nd ed., i, p. 43.

Scotocerca inquieta figured; J. A. MURRAY, Avif. Brit. India, i, p. 284.

Sittiparus, n. g. [type *Minla cinerea*, Blyth]; *id. Birds of India*, p. 17.

Stachyris borneensis, ♀ described [cf. Zool. Rec. xxiv, *Aves*, p. 57]; R. B. SHARPE, Ibis, 1889, pp. 413 & 414.

Suthora fear, n. sp. [♂], Tahò, Carin Mts., Burma; T. SALVADORI, Ann. Mus. Genov. xxvii [1889], pp. 363, 406, & 407. *S. ucebbiana*, new to Japan; T. SALVADORI & E. H. GIGLIOLI, Mem. Acc. Tor. xxxix, p. 124.

Thringorhina, n. g. [type *Turdinus* (*Stachyris*) *guttatus* (Tick.)]; E. W. OATES, Birds of India, i, p. 155.

Trochalopteron jerdoni figured; J. A. MURRAY, Avif. Brit. India, i, p. 85.

Turdinulus exul, ♀ described [cf. Zool. Rec. xxv, *Aves*, p. 62]; R. B. SHARPE, Ibis, 1889, p. 418.

Xenocichla nigriceps [♂ ♀], *X. placida*, n. spp., Kilimanjaro, E. Africa. G. E. SHELLEY, P. Z. S. 1889, pp. 362 & 363.

TROGLODYTIDÆ.

Campylorhynchus rufinucha, note on synonymy, distribution of various other species ; O. SALVIN & F. D. GODMAN, Ibis, 1889, pp. 234-236.

Elachura, n. g. [type *Troglodytes punctatus*, Blyth.]; E. W. OATES, Birds of India, p. 339.

Microcerculus orpheus, n. sp., Pacuare, Costa Rica ; R. RIDGWAY, P. U. S. Nat. Mus. xi [1888], p. 539.

Orthnocichla whiteheadi [cf. Zool. Rec. xxv, *Aves*, p. 62], figured and ♂ described ; R. B. SHARPE, Ibis, 1889, pp. 410 & 411, pl. xii.

Thryophilus sinaloa cinereus, n. subsp. [♂ ♀], Alamos, Sonora, Mexico ; W. BREWSTER, Auk, 1889, pp. 96 & 97.

Thryothorus oyapocensis, Ridgw., = *T. coraya* (L.), but *T. coraya*, Brit. Guiana, may stand as *T. ridgwayi*, n. sp. ; H. v. BERLEPSCH, J. f. O. 1889, p. 293.

Troglodytes fumigatus kurilensis, n. subsp., Shiashekotan, Kuril Is. ; L. STEJNEGER, P. U. S. Nat. Mus. xi [1888], p. 548.

TURDIDÆ.

Catharus mexicanus, *C. fumosus*, notes on synonymy ; O. SALVIN & F. D. GODMAN, Ibis, 1889, p. 234.

Geocichla cuneata, n. sp. [♂ ♀], Herberton, Queensland ; C. W. DE VIS, P. R. Soc. Queensl. vi [1889], pp. 243 & 244. *G. aurata*, ♀ and juv. described [cf. Zool. Rec. xxv, *Aves*, p. 63] ; R. B. SHARPE, Ibis, 1889, pp. 266 & 267.

Merula subobscura, n. sp. [♂], Tahò, Burma ; T. SALVADORI, Ann. Mus. Genov. xxvii [1889], p. 414. *M. seebohmi*, note on ♀ [cf. Zool. Rec. xxv, *Aves*, p. 63] ; R. B. SHARPE, Ibis, 1889, p. 267.

Mimocichla ardesiaca, from Dominica ; P. L. SCLATER, P. Z. S. 1889, p. 326.

Nesomimus, n. g. [type *Orpheus melanotis*, Gould] ; *N. macdonaldi*, n. sp. [♂ ♀], Hood I., Galapagos ; *N. personatus*, n. sp. [♂ ♀], Abingdon I., Galapagos ; R. RIDGWAY, P. U. S. Nat. Mus. xii [1889], pp. 102-105.

Turdus comorensis figured [cf. Zool. Rec. xxii, *Aves*, p. 46] ; A. MILNE-EDWARDS & E. OUSTALET, N. Arch. Mus. (2) x, pp. 251 & 252, pl. vi. *T. iliacus*, details of supposed nesting in Bavaria ; O. REISER, J. f. O. 1889, pp. 180-182. *T. grayi*, Bp., in captivity, &c. ; K. T. LIEBE, Monatschr. Schutze Vogelw. 1889, pp. 147-154. *T. varius*, from Siena district ; S. BROGI, Boll. Soc. Nat. Napoli, 1889, pp. 272-274.

Zeledonia coronata, n. g. & sp. [♀], Laguna del Volcan de Póas, Costa Rica ; R. RIDGWAY, P. U. S. Nat. Mus. xi [1888], pp. 537 & 538.

VIREONIDÆ.

Cyclorhis, important note on nomenclature of Argentine species ; J. A. ALLEN, Ank. 1889, p. 269.

OLIGOMYODI.

COTINGIDÆ.

Tityra, synopsis of genus ; J. A. ALLEN, Bull. Am. Mus. Nat. Hist. ii, pp. 73 & 74.

EURYLEMIDÆ.

Calypomena whiteheadi, nests and eggs ; J. WHITEHEAD, Ibis, 1889, p. 437 [cf. Zool. Rec. xxiv, *Aves*, p. 41, and xxv, *Aves*, p. 64].

Psarisomus psittacinus, S. Müll., is referable to the Sumatran and Bornean species ; R. B. SHARPE, *l. c.* pp. 438 & 439.

PIPRIDÆ.

Chiroziphia pareola boliviana, n. subsp., Yungas, Bolivia ; J. A. ALLEN, Bull. Am. Mus. Nat. Hist. ii, p. 87.

PITTIDÆ.

Melospitta has priority over *Coracopitta*, *Scl.* [cf. Zool. Rec. xxv, *Aves*, p. 64] ; L. STEJNEGER, Auk, 1889, p. 79.

Pitta, notes on habits of genus, &c. ; J. WHITEHEAD, Ibis, 1889, pp. 440-443.

TYRANNIDÆ.

F. D. GODMAN & O. SALVIN, Biol. Centr. Am. :—

Myiozetetes texensis, in Zool. Rec. xxv, *Aves*, p. 66, should have the words "of Sclater & Salvin, P. Z. S. 1879, p. 513," added after it: further notes on synonymy of the same and on *M. similis*, &c., pt. lxxiii, pp. 41 & 42 :

Myiodynastes nobilis, *Scl.*, *M. audax*, range of species, pt. lxxiii, pp. 47-50 ; *M. hemichrysus*, figured, p. 50, pl. xxxviii, fig. 1 ;

Muscirora mexicana, ♂ ♀ figured, pt. lxxiii, pp. 53 & 54, pl. xxxix, figs. 1 & 2 ;

Myiobius fulvicularis, n. sp. [= *M. erythrurus*, pt.]. Costa Rica, Panama, Colombia, Ecuador, Peru, Amazon Valley, pt. lxxiii, p. 58 ; *M. capitata*, figured, p. 59, pl. xl, fig. 1 ;

Empidonax canescens, n. sp., Mexico [= *E. obscurus*, juv. of *Scl.*, Cat. Birds Brit. Mus. xiv, q.v.] ; *E. difficilis* = *E. bairdi*, the latter name having priority ; *E. viridescens*, Ridgw., = *E. flavescens*, Lawr. : *E. affinis*, Sw., = *E. fulvipes*, Lawr., synonymy ; *E. albigularis*, *E. atriceps*, figured, pt. lxxiii, pp. 70, 74-76, & 78-80, pl. xl, figs. 2 & 3 ;

Sirystes albogriseus figured, pt. lxxiii, p. 47, pl. xxxvii, fig. 1 ;

Contopus ochraceus figured, pt. lxxiii, p. 84, pl. xxxviii, fig. 2 ; *C. parinar*, Cab. & Heine, should stand as *C. musicus* (Sw.) : and *C. depressi-*

rostris, Ridgw., = *C. brachytarsus*; *C. borealis*, notes on synonymy, pt. lxxiv, pp. 81, 82, 86, & 87;

Myiarchus inquietus, n. sp., Acaguisotla, Chilpancingo, Tierra Colorada, Rio Papagaio, and Acapulco, in the State of Guerrero, Mexico; *M. mexicanus magister*, Ridgw., is a good species; *M. cinerascens*, notes on synonymy, pt. lxxiv, pp. 88-91; *M. flammulatus* figured, pt. lxxiii, p. 96, pl. xxxvii, fig. 2;

Tyrannus melancholicus, notes on synonymy, pt. lxxiv, pp. 101 & 102.

Conopophaga rusbyi, n. sp., Reyes, Bolivia; J. A. ALLEN, Bull. Am. Mus. Nat. Hist. ii, p. 96.

Elainea, important note on nomenclature of Argentine species; *id.*, Auk, 1889, p. 269.

Empidonax bolirianus, n. sp. (Yungas?), Bolivia; *id.*, Bull. Am. Mus. Nat. Hist. ii, pp. 86 & 87. *E. pulverius* [♂ ♀], Sierra Madre Mts. (Pinos Altos), Chihuahua, Mexico, *E. griseus* [♂ ♀], Lower California, Arizona (?), and Southern Sonora, Mexico, n. spp.; W. BREWSTER, Auk, 1889, pp. 86-89.

Ornithion pusillum olivaceum, n. subsp., Yquitos, Upper Amazon; H. v. BERLEFSCH, J. f. O. 1889, p. 301.

Pyrocephalus minimus, possibly n. sp., Chatham I., Galapagos; R. RIDGWAY, P. U. S. Nat. Mus. xii [1889], pp. 112 & 113.

TRACHEOPHONÆ.

DENDROCOLAPTIDÆ.

RIDGWAY, R. A Review of the Genus *Xiphocolaptes* of Lesson. P. U. S. Nat. Mus. 1889 [xii], pp. 1-20.

After distinguishing the above genus from those most nearly allied to it, the writer gives a key to the species, followed by the usual descriptions. *X. albicollis argentinus*, possibly n. subsp., Buenos Ayres; *X. sclateri*, n. sp. [= *X. emigrans*, pt., of Sclater and others], S.E. Mexico (Mts. of Vera Cruz); *X. virgatus*, n. sp., *loc. incert.* [ex Coll. Am. Mus. N. H.]; *X. ignotus*, n. sp. [♂ juv.], Ecuador; *X. saturatus*, possibly n. sp., Guayaquil, Ecuador; *X. cinnamomeus*, n. sp., E. Brazil (Bahia?); *X. major castaneus*, n. subsp. [♀], Bolivia.

— A Review of the Genus *Sclerurus* of Swainson. *T. c.* pp. 21-31.

A key to the species is followed by descriptions. *Tinactor fuscus*, Max., note on synonymy; *Sclerurus lawrencii*, [♀], n. sp., Bahia? [ex Coll. Am. Mus. N. H.]; cf. also *Sclerurus*, *infra*.

SCLATER, P. L. On some New Species and Genera of Birds of the Family *Dendrocolaptidae*. P. Z. S. 1889, pp. 32-34.

Hylexastastes, n. g. [type *Dendrocolaptes perroti*, Lafr.], p. 34;

Limnophyes, n. g. [type *Limnornis curvirostris*, Gould], p. 34;

Phacellodomus rufipennis, n. sp., Bolivia, p. 33;

- Philydor cervicalis*, n. sp., Brit. Guiana, p. 33 ;
Picolaptes parvirostris, n. sp., S.E. Brazil, pp. 33 & 34 ;
Thripophaga fusciceps, n. sp., Bolivia, p. 33 ;
Upucerthia bridgesi, n. sp., Bolivia, p. 32.

[SCIATER, P. L.] Notes on some recently-described Species of *Dendrocolaptidae*. Ibis, 1889, pp. 350-354, pl. xi.

Berlepschia rikeri figured ; *Dendroornis*, notes on synonymy ; *Dendrocincla rufo-olivacea*, Ridgw., may = *D. fuliginosa* (Vieill.) ; *D. castaneoptera* Ridg., may = *D. merula* (Licht.).

Anabazenops immaculatus, n. sp., Yungas or Reyes, Bolivia ; J. A. ALLEN, Bull. Am. Mus. Nat. Hist. ii, p. 92. *A. lineatus*, Lawr., should stand as *A. subularis lineatus* (Lawr.) ; H. v. BERLEPSCH, P. U. S. Nat. Mus. 1888 [xi], pp. 565 & 566.

Dendrocolaptes variegatus, n. sp., ex Lafresnaye Coll. (Boston) ; R. RIDGWAY, t. c. pp. 545 & 546.

Dendroornis punctigula, n. sp. [♂ ♀], Costa Rica and Veragua ; *id. t. c.* pp. 544 & 545.

Geositta longipennis, possibly n. sp. [♀], Point Elizabeth, Straits of Magellan ; *id. op. cit.* 1889 [xii], pp. 133 & 134.

[H] *Enicornis striata*, n. sp. (Valparaiso ?), Chile ; J. A. ALLEN, Bull. Am. Mus. Nat. Hist. ii, p. 89.

Homorus galathee, n. sp., Cuyaba, Matto Grosso, Brazil ; P. LEVZKÜHN, J. f. O. 1889, pp. 106 & 107.

Leptasthenura fuscescens, n. sp., Falls of the Madeira, S. America ; J. A. ALLEN, Bull. Am. Mus. Nat. Hist. ii, p. 90. *L. fuliginiceps boliviana*, n. subsp., N. Bolivia ; *id. t. c.* p. 91.

Leptasthenura and *Phacellodomus*, important note on nomenclature of Argentine species ; *id.*, Auk, 1889, p. 269.

Philydor rufobrunneus, *P. virgatus*, Lawr. (Ann. Lyc. N. H., New York, 1865, p. 127, 1867, p. 468), are probably of genus *Automolus* ; H. v. BERLEPSCH, P. U. S. Nat. Mus. 1888 [xi], p. 565.

Picolaptes gracilis, n. sp. [♀], Monte Redondo, Costa Rica ; R. RIDGWAY, t. c. p. 542. *P. oblectus*, n. sp. = *P. lacrymiger*, Lafr. ; J. A. ALLEN, Bull. Am. Mus. Nat. Hist. ii, p. 94, note.

Sclerurus canigularis, n. sp. [♂], Turrialba, Costa Rica ; R. RIDGWAY, P. U. S. Nat. Mus. 1888 [xi], p. 542, 1889 [xii], pp. 24 & 25.

Synallaxis griseiventris, n. sp., Yungas, Bolivia ; J. A. ALLEN, Bull. Am. Mus. Nat. Hist. ii, p. 91.

Upucerthia propinqua, n. sp. [♀], Gregory Bay, Straits of Magellan ; R. RIDGWAY, P. U. S. Nat. Mus. 1889 [xii], p. 134.

Xiphocolaptes emigrans costaricensis, [♂ ♀], n. subsp., Naranjo, Cartago, Costa Rica ; *id. op. cit.* 1888 [xi], p. 541, 1889 [xii], p. 8.

FORMICARIIDÆ.

Myrmochanes, n. g. [type *M. hypoleucus*, n. sp., Reyes, Bolivia] ; J. A. ALLEN, Bull. Am. Mus. Nat. Hist. ii, pp. 95 & 96.

Phlogopsis notata, n. sp., Lower Beni River, S. America ; *id. t. c.* p. 97.

Terenura elaepteryx, n. sp., Cayenne or Bogota ; P. LEVERKÜHN, J. f. O. 1889, pp. 107 & 108. This specimen was bought from Jamrach, of London, for the Kiel Museum, in 1857.

PTEROPTOCHIDÆ.

Scytalopus bolivianus, n. sp., Reyes, Bolivia ; J. A. ALLEN, Bull. Am. Mus. Nat. Hist. ii, p. 98.

PICARIÆ.

PICIDÆ.

The family, see MARSHALL, W., BIGNON, FANNY.

HARGITT, E. Notes on Woodpeckers. No. xv. Ibis, 1839, pp. 58-60. Nos. xvi & xvii. T. c. pp. 229-232, 354, & 355.

Campophilus splendens, n. sp. [♂ ♀], near *C. hæmatogaster*, " Amazons," Panama and Santa Elena, Medellin ;

Chrysoptilus mariæ, n. sp., near *C. icteromelas*, Chamicuro, E. Peru ;

Dendrobates fidelis, n. sp., near *D. olivinus*, Bogota ;

Picumnus flavifrons [♂ ♀], Sarayacu, Peru, *P. wallacii* [♂], Amazons, n. spp., p. 229 ;

Chloronerpes gularis, n. sp. [♂], Santa Elena, Antioquia, p. 230 ;

Certhneipicus occidentalis, n. sp. [♂], Upper Ucayali, Peruvian Amazons, [♀] Brazil, pp. 230 & 231 ;

Chrysocolaptes rufopunctatus, n. sp. [♀], Panaon, Philippines, p. 231 ;

Chrysophlegma humii, n. sp. [= *C. squamicolle*, Harg., nec Lesson], ♂ Malacca, ♀ Klang, Salangore, pp. 231 & 232 ;

Picumnus undulatus, n. sp. [♂ ♀], Roraima, Brit. Guiana, and Camacusa, pp. 354 & 355.

Centurus canescens, n. sp., Ruatan I., Bay of Honduras ; O. SALVIN, Ibis, 1889, pp. 370 & 371.

Chloronerpes auricularis, n. sp., Xautipa, Sierra Madre del Sur, State of Guerrero ; *id.* & F. D. GODMAN, t. c. pp. 381 & 382.

Dendrocopus minor figured ; LORD LILFORD, Col. Fig. Br. Birds, pt. x.

Dryobates pubescens oreæcus, n. subsp. [♂ ♀], Las Vegas Hot Springs, New Mexico, and Loveland, Larimer co., Colorado ; C. F. BATCHELDER, Auk, 1889, pp. 253-255.

Dryoscopus major casatii, n. subsp. : note on *D. picatus*, Hartl., and its allies ; G. HARTLAUB, J. f. O. 1889, pp. 116-120.

Gecinus canus figured ; E. H. GIGLIOLI & A. MANZELLA, Icon. Avif. Ital. pt. xliv. *G. gorii* [cf. Zool. Rec. xxiv, *Aves*, p. 59] figured ; R. B. SHARPE, Tr. L. S. v, p. 83, pl. vi, fig. 1 : notes on it ; G. RADDE & A. WALTER, Ornith., 1889 [v], pp. 75-77 & 169.

Hemicercus, notes on species from Indian Region ; E. HARTERT, J. f. O. 1889, pp. 360-362.

Lynx, see FÜRBRINGER, M.

Picoïdes tridactylus figured ; E. H. GIGLIOLI & A. MANZELLA, Icon. Avif. Ital. pt. xliv.

Picumnus flavotinctus, n. sp. [♂ ♀], Costa Rica (Pacific side) to Panama ; R. RIDGWAY, P. U. S. Nat. Mus. 1888 [xi], pp. 543 & 544.

Picus, on type of genus ; A. REICHENOW, J. f. O. 1889, p. 187. *P. (Dendrocopus) canariensis*, n. sp., Canary Is. ; A. KÖNIG, J. f. O. 1889, p. 263. *P. (Chrysophegma) pierrii*, n. sp. [♂ ♀], French Cochinchina : E. OUSTALET, Le Nat. 1889, pp. 44 & 45. *P. liffordi*, *P. leuconotus*, *P. medius*, figured ; E. H. GIGLIOLI & A. MANZELLA, Icon. Avif. Ital. pt. xliv.

TROCHILIDÆ.

The family, see SHUFELDT, R. W. [anat.].

SIMON, E. Trochilidés observés a San-Esteban. Mem. Soc. Zool. Fr. 1889 [ii], pp. 217-225.

Adelomyia aëneosticta, n. sp. [= *A. melanogenys*, pt., Gould, *nec* Fraser], Venezuela, p. 223.

— Notes sur quelques espèces de Trochilidés. *T. c.* pp. 226-231.

Psallidoprymna eucharis, a second specimen, with notes, pp. 225 & 227.

Eriocnemis godini, a second specimen, with notes, pp. 228 & 229 : notes on *Thalurania fumyæ*, *T. hypochlora*, and *T. eryphyle*, first two are identical, p. 229.

Chalcocercus berlepschi, n. sp., Ecuador, pp. 230 & 231.

BELDING, L. Humming Birds of the Pacific Coast. West Am. Scientist. vi, pp. 109 & 110.

Amazilia aëneobrunnea, n. sp., Bogota ; F. M. CHAPMAN, J. f. O. 1889, p. 329. *A. laurencii*, *Eriocnemis incultus*, n. spp., Bogota ? ; D. G. ELLIOT, Auk, 1889, pp. 209 & 210.

Chalcocercus burmeisteri figured ; P. L. SCLATER & W. H. HURSON, Argent. Orn. ii, p. 2, pl. xi.

Delatiria margarita, n. sp., Mexico, Omilteme in Sierra Madre del Sur ; O. SALVIN & F. D. GODMAN, Ibis, 1889, pp. 239 & 240.

Iache nitida, n. sp., Mexico, Acapulco, Rio Papagaio, State of Guerrero : *ibid.* t. c. p. 240.

Phaethornis rioja, n. sp., Rioja, N. Peru ; H. V. BERLEPSCH, t. c. p. 182.

Uranomitra ellioti, n. sp., = *U. quadricolor*, Elliot, = *U. cyanocephala* auct. ?, Mazatlan, in summer ; *id.* P. U. S. Nat. Mus. 1888 [xi], pp. 561 & 562.

CYPSELIDÆ.

The family, see SHUFELDT, R. W. [anat.].

PARKER, W. K. On the Systematic Position of the Swifts (*Cypselidæ*). Zool. 1889, pp. 91-95.

The author considers the Swifts to be more nearly related to the Swallows than is usually supposed, saying: "Amongst all *Passeres* and related types, a Swallow is the only bird in which I have found a second or ungual phalanx to the 'pollex' (that Swallow being the Sand-Martin); this tends to confirm the isolated position of the Swallows among the members of their order."

LUCAS, F. A. The Main Divisions of the Swifts. Auk, 1889, pp. 8-13.

The author proposes to form a new family, *Dendrochelidonidæ*, to contain the genus *Dendrochelidon* alone, which he finds to differ structurally from the *Micropodidæ* or other Swifts, and to approach somewhat to the Goat-suckers. He includes these two families under a superfamily, *Micropodoideæ*, while he allows the division of the *Micropodidæ* into *Micropodineæ* and *Chaturinæ*.

ZEHNTER, L. Zur Entwicklung von *Cypselus melba* (Alpensiegler). Zool. Anz. 1889, pp. 556 & 557, 3 figs.

Cypselus apus, its development ; L. ZEHNTER, Arch. Sci. Nat. 1889, pp. 479 & 480.

Chætura caudacuta from New Zealand ; T. W. KIRK, Ibis, 1889, p. 298.

Cypselus minusculus, n. sp. [♀], Meteolè, Burma ; T. SALVADORI, Ann. Mus. Genov. xxvii [1889], p. 383.

CAPRIMULGIDÆ.

The family, see SHUFELDT, R. W. [anat.].

Antrostomus vociferus in West Indies (Porto Rico) ; C. B. CORY, Auk, 1889, p. 276.

Caprimulgus atripennis, *C. mahrattensis*, *C. indicus*, *C. asiaticus*, *C. monticolus*, eggs figured ; H. E. BARNES, J. Bomb. N. H. Soc. iv, pl. i.

Hydropsalis furcifera figured ; P. L. SCLATER & W. H. HUDSON, Argent. Orn. ii, pp. 15 & 16, pl. xii.

ALCEDINIDÆ.

Halcyon vagans, egg figured ; A. J. NORTH, Oology of Lord Howe Island, pl. i, fig. 3.

Tanyseptera meyeri, n. sp. [= *T. galeata*, Meyer (*nec* G. R. Gr.)]. Kafs, New Guinea ; T. SALVADORI, Mem. Acc. Tor. xl, p. 54. *T. rostellatus*, n. sp., Rossel I. ; H. B. TRISTRAM, Ibis, 1889, p. 557.

BUCEROTIDÆ.

BEDDARD, F. E. Contributions to the Anatomy of Picarian Birds. Part I. On some Points in the Structure of the Hornbills. P. Z. S. 1889, pp. 587-594, 4 cuts.

In the visceral anatomy the author finds the lobes of the liver to vary much in size in different species, and both to be separated from the abdomen by a membranous septum. In the syrinx there is much diversity on the whole, though in one or two species of *Buceros* it is alike, as it is in *Sphagolobus atratus* and *Ceratogymna elata*. In myology, *Aceros nipalensis* is compared with *Buceros atratus*, *Bucorvus abyssinicus*, *Ceratogymna elata*, and *Toccus*, for the leg muscles, and a few remarks are offered on the patagial muscles also. There is no attempt to determine the position of the family among its neighbours, but an effort is made to fix some of the generic types ; the result being to place *Bucorvus* quite apart ; to do so, more doubtfully, in the case of *Bycanistes* and *Toccus* ; and to combine *Aceros* with *Buceros*. No decided opinion ventured upon as to *Ceratogymna* and *Sphagolobus*.

Anorhinus austeni, Jerd., 3 specimens from Upper Assam, showing the species to be valid ; E. HARTERT, J. f. O. 1889, pp. 195 & 196.

Lophoceros alboterminatus, n. sp. [♂ ♀], Gambos, Upper Cunene, S.W. Africa ; J. BÜTTIKOFER, Notes Leyd. Mus. xi [1889], pp. 67 & 68.

UPUPIDÆ.

Upupa epops in Arabic legends ; P. LEVERKÜHN, Zool. Gart. 1889, pp. 173-179 : breeding in Madeira group ; HARTWIG, J. f. O. 1889, p. 322.

MEROPIDÆ.

Merops mentalis, n. subsp., near *M. mülleri*, Cass., Cameroons district ; J. CABANIS, J. f. O. 1889, p. 78.

MOMOTIDÆ.

Momotus brasiliensis ignobilis, n. subsp., Shanusi, near Yurimagua, Upper Amazon ; H. v. BERLETSCH, J. f. O. 1889, p. 307.

STEATORNITHIDÆ.

PARKER, W. K. On the Osteology of *Steatornis caripensis*. P. Z. S. 1889, pp. 161-190, pls. xvii-xx.

The osteology is here extremely fully and most technically treated, under the heads of:—(1) Introductory Remarks; (2) The Skull; (3) The Vertebral Chain and Ribs; (4) The Sternum and Shoulder-Girdle; (5) The Wing; (6) The Hip-Girdle and Hind Limbs; (7) Summary, &c. In the last of these the author comes to the conclusion that the species in question is an archaic Bird, with no near relations, properly so-called; and while he calls in question, in passing, several details of our usual classifications, he does not make any clear suggestion for an alternative arrangement, though isolated recommendations are made at intervals.

TROGONIDÆ.

The family, see SHUFELDT, R. W. [anat.].

Note on eggs of *Trogonidæ*; A. NEHRKORN, J. f. O. 1889, p. 286.

Hapaloderma vittatum, a second specimen; G. E. SHELLEY, P. Z. S. 1889, p. 359.

RHAMPHASTIDÆ.

Pteroglossus precilosternus, Gould, = *P. pluricinctus*; H. v. BERLEPSCH, J. f. O. 1889, p. 311.

CAPITONIDÆ.

In Zool. Rec. xxv, *Aves*, p. 70, the name of the family is omitted, just before *Megalama*.

Burbatula chrysopyga, n. sp., Gold Coast; G. E. SHELLEY, *Ibis*, 1889, p. 477.

Cyanops monticola, n. sp., Kina Balu Mt., N. Borneo; R. B. SHARPE, *Ann. N. H.* (6) iii [1889], pp. 423 & 424.

Erythrobucco, n. g. [type *E. rolleti*]; G. E. SHELLEY, *Ibis*, 1889, pp. 475 & 476.

Hellobucco, n. g. [type *H. bonapartii*]; *id. t. c.* p. 476.

Melanobucco, n. g. [type *M. bidentatus* (Shaw)]; *M. æquatorialis*, n. sp. [♂], Hparo, Equat. Africa, Niam-niam country; *id. t. c.* p. 476.

Mesobucco, n. g. [type *M. duvauceli*]; *id. t. c.* p. 477.

Ptilopogon pyrolophus, its note; E. HARTERT, J. f. O. 1889, p. 196.

Smilorhis kilimensis, n. sp. [♀], Kilimanjaro district, E. Africa; G. E. SHELLEY, *Ibis*, 1889, p. 477.

INDICATORIDÆ.

Indicator variegatus virescens, n. subsp. [♂], Lewa (Usambara), E. Africa; A. REICHENOW, J. f. O. 1889, p. 273.

CUCULIDÆ.

Cacomantis arfakianus, n. sp., Arfak Mts., New Guinea; T. SALVADORI, Mem. Acc. Tor. xl, p. 49.

Coccyzus cinereus figured; P. L. SCLATER & W. H. HUDSON, Argent. Orn. ii, pp. 38 & 39, pl. xiii. *C. melanocoryphus* new to Galapagos; R. RIDGWAY, P. U. S. Nat. Mus. 1889 [xii], p. 113.

Cuculus canorus: the hen at times sits on her own eggs, and lays them of different colours [*teste* A. Müller]; A. WALTER, J. f. O. 1889, pp. 33-46. The statements referred to optical delusion; *t. c.* p. 73. This refers to a paper by A. MÜLLER (On an Instance of a Cuckoo Hatching its own Eggs), freely translated from the "Gartenlaube," vol. xxvi, No. 25, 1888, in the Ibis, 1889, pp. 219-224.

Cuculus canorus, notes on the adoption of its eggs by Passerine Birds; X. RASPAIL, Bull. Soc. Z. Fr. 1889, pp. 45-50: more notes on the breeding question; J. RENNER, Zeitschr. f. Orn. u. prak. Gefluga, 1889, pp. 102 & 103: a theory of its parasitic habit; J. A. THOMSON, P. Phys. Soc. Edinb. 1888-89, pp. 60-67: observations of the Bird; J. A. LINK, Monatschr. Schutze Vogelw. 1889, pp. 439-453, 476-482, 502-510, & 534-537.

Cuculus canorus and its Indian allies; E. W. OATES, Ibis, 1889, pp. 355-359.

Eudynamis honorata, egg figured; H. E. BARNES, J. Bomb. N. H. Soc. iv, pl. i, fig. 214.

Lamprocoreyx poliurus, n. sp. [= *L. pæciluroides*, Meyer (*nec* Salvad.)], Tarawai I. ?; T. SALVADORI, Mem. Acc. Tor. xl, pp. 49 & 50.

MUSOPHAGIDÆ.

BEDDARD, F. E. The Pigment of the Touraco and the Tree Porcupine. Nature, xli [1889], p. 152.

PSITTACI.

The order, see MARSHALL, W., BIGNON, FANNY.

A Parrot Colony in the Argentine Republic; A. GÖRING, Monatschr. Schutze Vogelw. 1889, p. 382, pl., cut.

Agapornis fischeri [♀], *A. personata* [♂], figured; A. REICHENOW, J. f. O. 1889, pl. iv, figs. 1 & 2 [*cf.* Zool. Rec. xxiv, *Aves*, p. 62].

Ara couloni figured; H. v. BERLEPSCH, *t. c.* pp. 313 & 314, pl. iii, fig. 1.

Bolborhynchus aymara figured; P. L. SCLATER & W. H. HUDSON, Argent. Orn. ii, p. 46, pl. xv.

Brotoperyx gustavi, n. sp., Tuanfú, Upper Huallaga, E. Peru; H. v. BERLEPSCH, Ibis, 1889, pp. 181 & 182, pl. vi.

Chrysotis viridigenalis from E. Mexico; O. SALVIN & F. D. GORMAN, *t. c.* p. 241.

Conurus carolinensis, its nesting habits ; W. BREWSTER, Auk, 1889, pp. 336 & 337. *O. molinae* figured ; P. L. SCLATER & W. H. HUDSON, Argent. Orn. ii, p. 43, pl. xiv. *O. roseifrons*, ♂ ad., ♂ jun., ♂ juv. figured ; H. v. BERLEPSCH, J. f. O. 1889, pp. 314 & 315, pl. iii, figs. 2, 2a, & 2b.

Platycercus hochstetteri, n. sp., Antipodes I. ; A. REISCHEK, Tr. N. Z. Inst. xxi [1889], p. 387.

Psittacula, see HARTLAUB, G. *P. cyanopyga pallida* [♂ ♀], n. subsp., Alamos, Sonora, Mexico ; W. BREWSTER, Auk, 1889, pp. 85 & 86.

Psittovius caeruleus, see LAWRENCE, G. N.

Stringops, see FÜRBRINGER, M.

STRIGES.

The order, see MATSCHIE, P., BIGNON, FANNY.

SHUFELDT, R. W. Notes on the Anatomy of *Speotyto cunicularia hypogaea*. J. Morph. iii, pp. 115-125, pl. vii.

The Pterylography of this species differs somewhat from that of the rest of the Order, as described by Nitzsch ; and while certain structures of the head are noticeable, there is nothing peculiar in the interior of the ear, the tongue, or the larynx. With very well developed pectoral muscles this Owl couples a vomer which never seems to ossify, various peculiarities in the patagial group of muscles, and an arrangement of the plantar tendons at variance with that in several diurnal birds of prey.

STRODE, W. S. The Food of the Owls. Am. Nat. 1889, pp. 17-24, cf. pp. 832 & 833.

Figures of skeletons of *Asio accipitrinus*, *Nyctale tengmalmi*, and *Strix flammæa* ; A. B. MEYER, Abbild. Vogel-skel. pt. xiii, pla. cxxiii-cxxv, q.r.

Asio accipitrinus figured ; LORD LILFORD, Col. Fig. Br. Birds, pt. xi ; J. A. MURRAY, Avif. Brit. India, i, p. 106 : its food, see FISHER, A. K.

Athene novæ-zealandiæ, notes ; W. COLENSO, Tr. N. Z. Inst. xxi [1889], pp. 200-205.

Bubo lettii, n. sp., Pessy Country, Liberia ; J. BÜTTIKOFER, Notes Leyd. Mus. xi [1889], pp. 34 & 115, pl. vi. *B. ignavus* figured ; LORD LILFORD, Col. Fig. Br. Birds, pt. xi.

Carine or *Strix* ? ; A. REICHENOW, J. f. O. 1889, p. 187.

Glaucidium phalaenoides, description of egg ; G. B. SENNETT, Auk, 1889, pp. 70 & 71.

Heteroscops, n. g. Type, *Scops lucia* [♂ ♀], described and figured [cf. Zool. Rec. xxv, Aves, p. 73] ; R. B. SHARPE, Ibis, 1889, pp. 77-79, pl. iii.

Micropallas, n. g., = *Micrathene*, COUES, 1886, nec *Micrathena*, Sundevall, Arachn. ; E. COUES, Auk, 1889, p. 71.

Ninox rossliana, n. sp., Rossel I. ; H. B. TRISTRAM, Ibis, 1889, pp. 557

& 558. *N. affinis*, *N. obscura*, figured; J. A. MURRAY, *Avif. Brit. India*, i, pp. 107 & 109.

Scops capnodes, n. sp., Anjouan I., Comoro Group; J. H. GURNEY, *t. c.* pp. 104-107. *S. pryeri*, n. sp., Rynkyn Naba (Okinawasima?), Liu Kiu Is.; *id. t. c.* pp. 302-305. *S. asio maxwellia*, its nest and eggs; C. E. BENDIRE, *Auk*, 1889, pp. 298-302. *S. giu*, reported breeding in Essex; M. CHRISTY, *Ess. Nat.* 1889, pp. 17-19.

Syrnium aluco figured; LORD LILFORD, *Col. Fig. Br. Birds*, pt. xi.

ACCIPITRES.

FALCONIDE.

The family, see MENZBIER, M. A., MATSCHIE, P., FATIO, V., STUDER, T., & BIGNON, FANNY.

Figures of skeletons of *Gyps fulvus*, *Buteo vulgaris*; A. B. MEYER, *Abbild. Vogel-skel. pt. xiii*, pls. cxxi & cxxii.

BEDDARD, F. E. On certain Points in the Anatomy of the *Accipitres*, with reference to the Affinities of *Polyboroides*. *P. Z. S.* 1889, pp. 77-82, 2 cuts.

The above-mentioned species does not show any affinity to *Serpentarius* or the *Gypogeranidae* of Huxley, while it agrees with his *Gypaëtidae* [*Falconidae*], in having no semitendinosus muscle, though the group is hardly constant in this respect. In the form and division of the *tensor patagii brevis*, in the size of the deltoid and of the second pectoral muscle, *Polyboroides* agrees with the *Gypaëtidae*, though in the latter case it accords also with *Serpentarius*. It is a true member of the *Falconidae*.

SHUFELDT, R. W. Osteology of *Circus hudsonius*. *J. Comp. Med.* April, 1889, 35 pp., cuts.

The osteology of this "representative American Hawk" is compared with that of the Owls, &c.

Accipiter rufotibialis figured [*cf. Zool. Rec.* xxiv, *Aves*, p. 63], ♂ ad. and juv. described; R. B. SHARPE, *Ibis*, 1889, pp. 68-70, pl. ii. *A. nisus* breeds in the Madeira Group; HARTWIG, *J. f. O.* 1889, p. 328: its food, see FISHER, A. K.

Aquila chrysaëtus figured; LORD LILFORD, *Col. Fig. Br. Birds*, pt. x.

Archibuteo strophionotus, *Buteo plumipes*, figured; J. A. MURRAY, *Avif. Brit. India*, i, p. 26. *A. lagopus*, figured; E. H. GIGLIOLI & A. MANZELLA, *Icon. Avif. Ital.* pt. xlv; see also *Buteo*, *infra*.

Astur palumbarius, *A. soloensis*, figured; J. A. MURRAY, *Avif. Brit. India*, i, pp. 16 & 20.

Buteo borealis kriderii on coast of Georgia; W. BREWSTER, *Auk*, 1889, p. 70. *B. fuliginosus*, *Scl.*, = *B. brachyurus*, Vieill.; W. E. D. SCOTT, *t. c.* pp. 243-245. *B. ferox* figured; E. H. GIGLIOLI & A. MANZELLA,

Icon. Avif. Ital. pt. xlv. *B. noainsoni* figured; P. L. SCLATER & W. H. HUDSON, Argent. Orn. ii, pp. 59 & 60, pl. xvi. *B. vulgaris* and *B. lagopus*, their utility; E. ALTUM, J. f. O. 1889, pp. 173-177. See also *Archibuteo*, *suprà*.

Cerchneis tinnunculus canariensis, n. subsp., Canary Is.; A. KÖNIG, J. f. O. 1889, p. 263.

Circus humbloti [cf. Zool. Rec. xxii; *Aves*, p. 53, and xxiv, p. 64] is a good species, though only one specimen (from Madagascar) is known; A. MILNE-EDWARDS & E. OUSTALET, N. Arch. Mus. (2) x, pp. 234 & 235, cf. p. 233. *C. epsilon*, juv., described as ♀ ad. in Cat. Birds Brit. Mus.; R. B. SHARPE, Ibis, 1889, pp. 65-67, cf. p. 256. *C. wolfi* on Lord Howe I.; R. ETHERIDGE, Jun., Lord Howe Island, p. 8.

Falco, types of species; A. REICHENOW, J. f. O. 1889, pp. 187 & 188. *F. barbarus* of Sind, Mt. Aboo, &c. = *F. babylonicus*; E. A. BUTLER, Ibis, 1889, pp. 135 & 136, cf. p. 151. *F. minor*, measurements; J. H. GURNEY, t. c. p. 396.

Haliaetus albicilla figured; J. A. MURRAY, Avif. Brit. India, i, p. 51.

Hierofalco uralensis, ♂ and juv. figured; M. A. MENZBIER [N. A. SAVERZOFF], Orn. du Turkestan, pls. iv & v.

Milvus iclinus figured; LORD LILFORD, Col. Fig. Br. Birds, pt. xi; E. H. GIGLIOLI & A. MANZELLA, Icon. Avif. Ital. pt. xlv.

Nisaetus fasciatus, *N. pennatus* figured; *id. ibid.*

Pandion haliaetus, its former nesting in England; H. A. MACPHERSON, Zool. 1889, pp. 256-258.

Urospizias polionotus, n. sp. [= *U. albiventris* of Timor Laut, cf. Zool. Rec. xxi, *Aves*, p. 58]; T. SALVADORI, Mem. Acc. Tor. xl, pp. 19 & 20.

CATHARTIDÆ.

The family, pneumaticity, &c.; see BIGNON, FANNY.

Cathartes atratus, note on the air cavities; *id.* C.R. Soc. Biol. 1889, pp. 39 & 40. [Cf. Zool. Rec. xxv, *Aves*, p. 71.]

STEGANOPODES.

The order, see BIGNON, FANNY.

PHAETHONTIDÆ.

Phaethon rubricauda, egg figured; A. J. NORTH, Oology of Lord Howe Island, pl. i, fig. 1.

SULIDÆ.

Sula bassana, note on the air cavities; FANNY BIGNON, C.R. Soc. Biol. 1889, pp. 93-94. [See also Titles of Works, *suprà*.] *S. cyanops*, fig. of egg, with notes; R. ETHERIDGE, Jun., & A. J. NORTH, Lord Howe Island, p. 16, 1889. [VOL. XXVI.]

pl. i, fig. 2 : breeding at Curtis L, N. Z. ; T. F. CHEESEMAM, Tr. N. Z. Inst. xxi [1889], pp. 121 & 122. *S. fiber* new to Europe (France) : C. VAN KEMPEN, Bull. Soc. Z. Fr. 1889, p. 106. *S. gossi* [cf. Zool. Rec. xxv, *Aves*, p. 75], new to Galapagos ? ; R. RIDGWAY, P. U. S. Nat. Mus. 1889 [xii], p. 114. *S. fusca* at Napier, N. Z. ; A. HAMILTON, Tr. N. Z. Inst. xxi [1889], pp. 128-134.

PHALACROCORACIDÆ.

STEJNEGER, L., & LUCAS, F. A. Contributions to the Natural History of the Commander Islands [cf. Zool. Rec. xxiv, *Aves*, p. 36]. Contributions to the History of Pallas' Cormorant. P. U. S. Nat. Mus. 1889 [xii], pp. 83-94, pls. ii-iv.

Account of bird, description of bones, &c., tending to substantiate a difference between the genera *Phalacrocorax* and *Urile*.

Microcarbo pygmaeus, skeleton figured ; A. B. MEYER, Abbild. Vogel-skel. pt. xii, pl. cxiii.

Phalacrocorax brasiliensis (Gmel.), auct., should stand as *P. rufus* (Vieill.) ; R. RIDGWAY, P. U. S. Nat. Mus. 1889 [xii], pp. 138 & 139. *P. punctatus*, notes ; J. C. McLEAN, Ibis, 1889, pp. 299-302. *P. punctatus*, breeding habits and number of eggs ; T. W. KIRK, Tr. N. Z. Inst. xi [1888], p. 30.

HERODIONES.

The order, see BIGNON, FANNY.

ARDEIDÆ.

SHUFELDT, R. W. Osteological Studies of the Subfamily *Ardeidæ*. J. Comp. Med. 1889 [x], pp. 218-243 & 287-317, 37 cuts.

The author's object is to present a full account of the osteological characters of a typical American Heron [*Ardea herodias*], in which he discusses the skull, the vertebral column, the sternum, the pectoral arch, the pelvis and coccygeal vertebræ, ending with a synoptical and comparative review of the chief osteological characters of certain species of the subfamily found in America.

Ardea purpurea figured ; LORD LILFORD, Col. Fig. Brit. Birds, pt. xi. *A. garzetta*, skeleton figured ; A. B. MEYER, Abbild. Vogel-skel. pt. xii, pl. cxx.

Ardetta involucris figured ; P. L. SCLATER & W. H. HUDSON, Argent. Orn. ii, pp. 101-104, pl. xvii.

Botaurus lentiginosus, its "booming" note ; B. TORREY, Auk, 1889, pp. 1-8, cf. p. 187. *B. neorensis*, a second specimen ; W. E. D. SCOTT, t. c. pp. 317 & 318.

Zebrilus pumilus, from Upper Amazon ; H. v. BERLEPSCH, J. f. O. 1889, p. 318.

CICONIIDÆ.

Skeleton of *Ciconia alba* figured ; A. B. MEYER, Abbild. Vogel-skel. pt. xii, pl. cxix.

PLATALEIDÆ.

OGILVIE-GRANT, W. R. On the Genus *Platalea*, with a Description of a new Species from New Guinea. Ibis, 1889, pp. 32-58, pl. i, cut.

The author, while criticizing the views of Stejneger, Milne-Edwards and Grandidier, Seebohm, and others, gives a key to the species he recognizes, which are *P. leucorodia* (including *P. major*), *P. alba* (including *P. cristatus*, Scop., and *P. luzoniensis*, Bp.), *P. melanorhyncha*, *P. minor*, and *P. intermedia*, n. sp. (*infra*). He collates the measurements of a large number of specimens, in tables which follow the description of each member of the genus. [*Cf.* Ibis, 1889, pp. 258 & 259.]

Eudocimus albus, *E. longirostris*, a note ; P. L. SCLATER, P. Z. S. 1889, p. 26.

Ibis religiosa, note on a ligament of the neck which assists in raising it ; G. ROCHÉ, Bull. Soc. Philom. 1889, pp. 119 & 120.

Platalea leucorodia, skeleton figured ; A. B. MEYER, Abbild. Vogel-skel. pt. xii, pl. cxviii. *P. intermedia*, n. sp., Port Moresby, New Guinea ; W. R. OGILVIE-GRANT, Ibis, 1889, pp. 52-54, pl. i, figs. 2 & 2A. *P. melanorhyncha*, *P. intermedia*, *P. minor*, coloured figs. of heads ; *P. major*, *P. minor*, figs. of heads ; *id. t. c.* pl. i, cut.

ODONTOGLOSSÆ.

PHÆNICOPTERIDÆ.

SHUFELDT, R. W. Note on the Anserine Affinities of the Flamingoes. Science, 1889, pp. 224 & 225.

Phenicopterus, its "*manus*," the wing is more like that of an Ibis than that of a goose ; W. K. PARKER, Ibis, 1889, pp. 183-185. *P. roseus*, method of capture in Lower Egypt, Ed., Zool. 1889, pp. 136-139. [From information collected by LORD LILFORD.]

PALAMEDEÆ.

PALAMEDEIDÆ.

Chauna chavaria, exhibition of eggs ; P. L. SCLATER, P. Z. S. 1889, pp. 586 & 587.

ANSERES.

ANATIDÆ.

The family, see BIGNON, FANNY.

SUCHETET, A. Note sur les hybrides des Anatidées. Bull. Soc. Acclim. 1889, pp. 905-913, and °Rouen : 1889, 8vo, 16 pp. [Many species given.]

— . Nouvelles Observations sur les hybrides. *T. c.* pp. 985-993.

MONTLEZUN [COMTE DE]. Notes sur les Palmipèdes Lamellirostres, famille des Anatidés. *T. c.* pp. 708-718 & 777-785, 3 cuts. [Cf. Zool. Rec. xxv, *Aves*, p. 77.]

BRÉZOL, H. L'origine du Cabaye et du Canard de Barbarie. *T. c.* pp. 745-749.

— . Mélange de sang et croisement chez les Poules. *T. c.* pp. 818-820.

Spatula clypeata, *Fuligula Rufina*, *Bernicla leucopsis*, *Clangula glaucion*, *Anser albifrons* figured; LORD LILFORD, Col. Fig. Brit. Birds, pls. x & xi.

Querquedula creeca, *Anas boscos*, *Dafila bahamensis*, *Anser cinereus*, skeletons figured; A. B. MEYER, Abbild. Vogel-skel. pt. xii, pls. cxiv-cxvii.

Anas maculosa, sp. n. [♂ ♀], Nueces Bay, Corpus Christi, Texas; G. B. SENNETT, Auk, 1889, pp. 263-265. *A. boscos*, ♀ in plumage of male; T. WHITE, Tr. N. Z. Inst. xx [1888], p. 39.

Anser brachyrhynchus, further occurrences in Sweden; A. STUXBERG, Öfv. Ak. Förh. 1889, pp. 209-211.

Bernicla ruficollis, history of the Maldon specimen; E. A. FITCH, Esq. Nat. 1889, p. 35.

Biziura exhumata, n. sp., Chinchilla, Darling Downs, left metatars. The trochlea for the fourth toe is missing from the distal, the calcaneal process from the proximal end; C. W. DE VIS, P. R. Soc. Queensl. n [1889] pp. 57 & 58.

Chloephaga jubata, notes; G. ROGERON, Bull. Soc. Acclim. 1889, pp. 478-485 & 569-576, 2 cuts. [Cf. Zool. Rec. xxv, *Aves*, p. 35.]

Clangula glaucion said to breed at Swinsty Reservoir; W. STORY, Research, ii [1889], p. 120.

Cygnus davidi, notes; T. SALVADORI & E. H. GIGLIOLI, Mem. Ac. Tor. xxxix, pp. 117 & 118. *C. nigricollis* figured; P. L. SCLATER & W. H. HUDSON, Argent. Orn. ii, pp. 124 & 125, pl. xviii.

Nomonyx dominicus in Massachusetts; C. B. CORY, Auk, 1889, p. 336.

Pacilonetta galapagensis, n. sp. [♂ ♀], Charles I., Galapagos; R. RIDGWAY, P. U. S. Nat. Mus. 1889 [xii], pp. 115 & 116.

Somateria mollissima, the down, &c.; L. MAGAUD D'AUBUSSON, Bull. Soc. Acclim. 1889, pp. 896-901.

COLUMBÆ.

The order, see BIGNON, FANNY.

COLUMBIDÆ.

BRISAY [MARQUIS DE]. Sur la reproduction de quelques Colombes Exotiques encore rares. Bull. Soc. Acclim. 1889, pp. 52-57.

Geopelia cuneata, *G. placida*, *G. humeralis*, *Columba guinea*, *Turtur semgalensis*, *Chalcophaps indica*.

TEICHMANN, M. Der Kropf der Taube. Arch. mikr. Anat. xxxiv, pp. 235-247.

FELLNER, — v. Experimente über Hin- und Rückflug der Militär-Brieftauben. Berlin: 1889, 16mo, 32 pp.

Racetauben-Schädel and Almond Tümmeler (skeleton) figured; A. B. MEYER, Abbild. Vogel.-skel, pts. xii & xiii, pla. cxii & cxxix.

Ectopistes migratorius, its status and habits; W. BREWSTER, Auk, 1889, pp. 286-291.

Geotrygon montana, new to N. America; W. E. D. SCOTT, t. c. pp. 160 & 161.

Macropygia cinereiceps, n. sp., Fergusson I. and S.E. New Guinea; H. B. TRISTRAM, Ibis, 1889, p. 558.

Zenaida rubripes, a correction; G. N. LAWRENCE, Auk, 1889, p. 21.

PTEROCLIDÆ.

Pterocles, heads of Indian species figured; J. A. MURRAY, Avif. Brit. India, ii, p. 520. *P. tuchypetes* figured; H. A. BRYDEN, Kloof and Karroo, pl. xiii, fig. 1.

SYRRHAPTES PARADOXUS.

Skeleton figured; A. B. MEYER, Abbild. Vogel.-skel. pt. xiii, pl. cxxviii. Figured; M. BROWNE, Vertebrate Animals of Leicestershire, pl. ii.

TSCHUDI ZU SCHMIDHOFFEN, V. v. Beiträge zum Vorkommen des Steppenhahnes (*Syrnhaptes paradoxus*, Pall.). Monatschr. Schutzze Vogelw. 1889, pp. 249-252.

MAGAUD, D'AUBUSSON, L. Le Syrrhapte paradoxal et sa Naturalisation spontanée en Europe. Bull. Soc. Acclim. 1889, pp. 217-229.

NEWTON, A. On *Syrnhaptes paradoxus* as a Native of Britain. (Abst.) Rep. Brit. Ass. 1889, p. 616.

Exhibition of specimen, not more than two or three days old, captured in North of Scotland, on August 8th, 1889.

England.

- Syrrhaptes paradoxus*, at Redcar [Feb., 1889], in Cleveland [1889]: T. H. NELSON, Zool. 1889, p. 146, Naturalist, 1889, pp. 52 & 78.
- " " in Humber district; J. CORDEAUX, Zoologist, 1889, p. 34, Naturalist, 1889, pp. 1, 3, & 129.
- " " in Yorkshire Wolds; E. HOWARTH, *t. c.* p. 24.
- " " at York; W. HEWETT, *t. c.* p. 78.
- " " at Skegness [1889]; J. E. MASON, *ibid.*
- " " at Louth (Lincolnshire) [Feb., 1889]: H. F. ALLISON, Zool. 1889, p. 184.
- " " in Lancashire in 1888, generally; R. J. HOWARD, *t. c.* pp. 51-55.
- " " in Norfolk; J. H. GURNEY, Jun., *t. c.* p. 334.
- " " in Notts [nest and two eggs]; J. WHITAKER, *t. c.* p. 351.
- " " in Herts [1888]; J. HOPKINSON, Tr. Hertf. Soc. 1889, pp. 139 & 140.
- " " in Essex [1889]; W. CROUCH, Ess. Nat. 1889, p. 92.
- " " in Gloucestershire [Yate and Hambrook]; ED. P. Bristol Soc. 1889, p. 115.
- " " in Surrey; E. SALMON, Zool. 1889, p. 227.

Scotland and Ireland.

EVANS, W. Notes on Pallas's Sand Grouse (*Syrrhaptes paradoxus*) in Scotland during the recent great westward movement of the Species. P. Phys. Soc. Edinb. 1888-89, pp. 106-126.

SIM, G. Pallas's Sand Grouse in Aberdeenshire in 1888, with an account of its habits and anatomical peculiarities. Aberdeen: 1889, 8vo, 23 pp., 3 pls.

- Syrrhaptes paradoxus*, in Fife; P. HENDERSON, Zool. 1889, p. 383.
- " " occurrences in Ireland; R. F. SCHARFF, Sci. P. R. Dubl. Soc. 1889, p. 278-282.
- " " in co. Down [Nov., 1888]; R. L. PATTERSON, Ibis, 1889, p. 137.
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Syrrhaptes paradoxus. Reports from the Continent. ED., Zool. 1889, pp. 56-60. Includes accounts of supposed breeding in Sleswig, from the 'Schleswigschen Nachrichten' in the 'Bremer Nachrichten,' No. 329, Nov. 27th, 1888.

Syrhaptes paradoxus, in N. France ; C. VAN KEMPEN, Bull. Soc. Z. Fr. xiv, pp. 18-21.

" " in France generally [up to Jan., 1889] ; J. VIAN, t. c. pp. 78 & 79.

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" " in France generally ; A. GRANGER, Le Nat. 1889, p. 34.

REICHENOW, A. *Syrhaptes paradoxus* in Deutschland, 1888. J. f. O. 1889, pp. 1-33.

TACHSI ZU SCHMIDHOFFEN, V. v. Vorläufiges über den Zug des Steppenhubnes (*Syrhaptes paradoxus*, Pall.) durch Oesterreich-Ungarn im Jahre 1888-89. MT. orn. Ver. Wien, 1889, pp. 208-214, & 497-500. Nachträge : T. c. pp. 289-290.

Syrhaptes paradoxus, at Pawlowicz (near Zlotnik in Posen) [20th April, 1889] ; A. REICHENOW, J. f. O. 1889, p. 328 : two instances of breeding in Germany ; *id.* t. c. p. 84.

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GALLINÆ.

The order, see BIGNON, FANNY. .

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LEVERKÜHN, P. Beschreibung zweier Rackelhähne und einer hahnenfedrigen Auerhähne. Aus dem Strasburger Museum. MT. orn. Ver. Wien, 1889, pp. 361-363.

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Circus rufus n. subsp. *australis* is the Partridge of Gran Canaria. *C. pelona* that of Teneriffe and Gomera; H. B. TRISTRAM, Ibis, 1889, pp. 27-29.

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Galloperdix spadicea, notes; A. MAIRET, Bull. Soc. Acclim. 1889, pp. 300 & 301.

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MEGAPODIIDÆ.

Megapodius tumulus and *Tategalla luthami*, habits described, &c., the method of extrication of the young of the latter from the mound; C. LUMHOLTZ, Among Cannibals, pp. 149, 150, & 326.

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HERRERA, A. L. Aparatos de la fonacion en la *Ortalis vetula maccalli* y en el *Pithyophis deppei*. Nat. Mex. (2) i, pp. 278-282.

TURNICIDÆ.

OGILVIE-GRANT, W. R. On the genus *Turnix*. Ibis, 1889, pp. 446-475, pl. xiv, cut.

A valuable addition to our knowledge of the subject, the main details of which are given below. The writer arranges the species in two

sections—the first containing 4 groups, and gives a key for their further determination. *Turnix nigrifrons*, auct., is a made-up specimen : p. 443. *T. beccarii* of Salvadori, = *T. rufescens*, Wallace ; *ibid.* *T. plumbeus*, *T. luigoo*, *T. rostrata*, *T. blakistoni*, are merely climatic varieties of one species due to the rainfall ; pp. 453–458. *T. pugnax* is an insular form of the same, but may stand as a species ; p. 459. *T. haynaldi* [*Cf. Zool. Rec.* xxv, *Aves*, p. 88], = *T. fasciata*, Temm. : p. 460. *T. leperans* is only a small race of *T. sylvatica* ; p. 462. *T. maculosa*, auct., nec Temminck, must stand as *T. blanfordi*, *T. melanotus* (Gould) as *T. macurus* (Temm.) ; pp. 467 & 468. *T. ocellata* (Scoop.) figured : pp. 469–471, pl. xiv. *T. nigricollis*, plumage of sexes ; pp. 471 & 472. *T. scintillans* (Gould), is ♂ of *T. varius* ; p. 473.

OPISTHOCOMI.

OPISTHOCOMIDÆ.

BEDDARD, F. E. Contributions to the Anatomy of the Hoatzin (*Opisthocomus cristatus*), with particular Reference to the Structure of the Wing in the Young. *Ibis*, 1889, pp. 283–293, 4 cuts. [*Cf. Zool. Rec.* xxv, p. 88.]

While there is nothing strikingly new in this communication, it will be of the greatest use as a summary of many points connected with the above-mentioned bird's anatomy, and as correcting several misapprehensions of former writers on the subject, especially with regard to pterylography. Probably no other student has had so perfect a series of specimens on which to work.

Opisthocomus cristatus, exhibition of specimens, with remarks : P. L. SCLATER, P. Z. S. 1889, p. 57.

FULICARIÆ.

The order, see BIGNON, FANNY.

RALLIDÆ.

Fulva atra, skeleton figured : A. B. MEYER, Abbild. Vogel.-skel. pt. xiii, pl. cxxx.

Notornis mantelli in W. Otago ; J. PARK, Tr. N. Z. Inst. xxi [1889], pp. 226–230.

Notornis alba, *Oxydromus sylvestris*, good notes ; R. ETHERIDGE, Jun. Lord Howe Island, pp. 11–13.

Pennula mullsi, exhibition of a specimen of the so-called bird, with remarks : A. NEWTON, P. Z. S. 1889, p. 5.

Porphyrio bemmeleni, n. sp., Lake Toba, interior of Sumatra ; J. BÜTTIKOFER, Notes Leyd. Mus. xi [1889], pp. 191 & 192. *P. alleni* new to Comoro Is. ; A. MILNE-EDWARDS & E. OUSTALET, N. Arch. Mus. (2) x, p. 279.

Rallina woodfordi, n. sp., Aola, Guadalcanar, Solomon Archipelago ; W. R. OGILVIE-GRANT, Ann. N. H. (6) iv [1889], p. 320.

Rallus coryi, n. sp., Bahamas ; C. J. MAYNARD, Amer. Exchange and Mart, Jan. & Feb., 1887 [omitted in Zool. Rec. xxiv]. *R. longirostris*, *R. l. caribæus*, *R. coryi*, *R. crepitans*, *R. c. saturatus*, *R. obsoletus*, *R. scottii*, discussed ; G. B. SENNETT, Ank, 1889, pp. 161-166 [cf. Zool. Rec. xxv, Aves, p. 89]. *R. maculatus* figured ; P. L. SCLATER & W. H. HUDSON, Argent. Orn. ii, p. 148, pl. xix.

ALECTORIDES.

The order, see BIGNON, FANNY.

GRUIDÆ.

Balearica pavonina, skull figured ; A. B. MEYER, Abbild. Vogel-skel. pt. xii, pl. cxi.

CARIAMIDÆ.

BEDDARD, F. E. On the Anatomy of Burmeister's *Cariama* (*Chunga burmeisteri*). P. Z. S. 1889, pp. 594-602, 4 cuts.

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Cariama cristata, its breeding in Zool. Soc. Gardens (London) ; A. NEWTON, P. Z. S. 1889, pp. 25 & 26, pl. i [2 eggs].

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Bustard Hawking in Morocco ; J. THOMSON, Travels in the Atlas, &c., pp. 59 & 60.

Houbara macqueeni in France (1st time), account of various specimens ; L. BUREAU, Bull. Soc. Zool. Fr. xiv [1889], pp. 308-312.

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LIMICOLÆ.

The order, see BIGNON, FANNY.

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Cursorius gallicus figured; M. BROWNE, Vertebrate Animals of Leicestershire, pl. 3.

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Vanellus leucopterus, n. sp., = *V. crassirostris*, Seeb. (Distrib. Charad.). Quilimane, E. Africa; A. REICHENOW, J. f. O. 1889, pp. 265 & 266.

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GAVIÆ.

The order, see BIGNON, FANNY.

LARIDÆ.

Anous cinereus, *A. stolidus*, *Sterna fuliginosa*, eggs figured ; A. J. NORTH, Oology of Lord Howe Island, pl. i, figs. 4, 6, & 7.

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IMMANES.

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REPTILIA AND BATRACHIA.

BY

G. A. BOULENGER.

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I. ICHTHYOSAURIA.

II SAUROPTERYGIA.

- | | | |
|------------------------------|---|-----------------------------|
| III. TESTUDINATA | { | 1. <i>Trionychia</i> . |
| | | 2. <i>Cryptodira</i> . |
| | | 3. <i>Pleurodira</i> . |
| IV. THEROMORPHA | { | 1. <i>Anomodontia</i> . |
| | | 2. <i>Placodontia</i> . |
| | | 3. <i>Pareiosauria</i> . |
| | | 4. <i>Theriodontia</i> . |
| V. RHYNCHOCEPHALIA | { | 1. <i>Rhynchocephalia</i> . |
| | | 2. <i>Proganosauria</i> . |
| VI. LEPIDOSAURIA | { | 1. <i>Lacertilia</i> . |
| | | 2. <i>Pythonomorpha</i> . |
| | | 3. <i>Ophidia</i> . |
| VII. CROCODILIA | { | 1. <i>Parasuchia</i> . |
| | | 2. <i>Eusuchia</i> . |
| VIII. DINOSAURIA | { | 1. <i>Sauropoda</i> . |
| | | 2. <i>Theropoda</i> . |
| | | 3. <i>Orthopoda</i> . |
| IX. PTEROSAURIA. | | |

HAECKEL (*supra*, p. 1), p. 636, divides the Reptilia into 9 orders: *Tocosauria*, *Autosauria*, *Ophidia*, *Crocodilia*, *Chelonina*, *Halisauria*, *Pterosauria*, *Dinosauria*, *Theriosauria*.

6 Rept.

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PYGOPODIDÆ.

- Lialis burtonii*, Gray, figured by MCCOY, Prodr. Zool. Vict. pl. clxii.
- Aprasia pulchella*, Gray, figured; *id. ibid.* pl. clxi, fig. 1.
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Tympanocryptis lineata, Ptrs., figured by MCCOY, Prodr. Zool. Viet. pl. clxxxi.

IGUANIDÆ.

Urostrophus scapulatus, Burm. (= *Leiosaurus multipunctatus et marmoratus*, Burm.), described and figured by BOULENGER, P. Z. S. 1889, p. 144, pl. xv, fig. 2.

Tropidurus lemniscatus, n. sp., COPE, P. U. S. Nat. Mus. xii, p. 145, Chatham I., Galapagos.

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Lysoptychus, n. g., distinguished from *Sceloporus*, Wgm., by the presence of a loose fold across the throat. *L. lateralis*, n. sp., COPE, P. U. S. Nat. Mus. xi, p. 397, Texas.

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VARANIDÆ.

Varanus dirus and *emeritus*, n. spp. (foss.), DE VIS, P. R. Soc. Queensl. vi, p. 98, King's Creek, Darling Downs, Queensland. *Notosaurus dentatus*, Ow., is probably, like *Megalanina prisca*, Ow., a *Varanus*; *id. ibid.* p. 97.

TEIIDÆ.

Proctoporus lividus, n. sp., THOMINOT, Bull. Soc. Philom. (8) i, p. 25, Ecuador. [= *P. unicolor*, Gray.—REC.]

AMPHISBENIDÆ.

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LACERTIDÆ.

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Psammotromus microdactylus, Bttg.: notes by BOULENGER, Ann. N. H. (6) iii, p. 304.

Scapteira acutirostris, Blgr., figured by BOULENGER, Tr. L. S. (2) v, pl. ix, fig. 4.

GERRHOSAURIDÆ.

Gerrhosaurus zanzibaricus, PFEFFER, JB. Hamb. vi, 2, p. 7, Zanzibar. [= *G. major*, A. Dum.—REC.]

SCINCIDÆ.

Tiliqua (Cyclodus) occipitalis, Ptrs., figured by McCoy, Prodr. Zool. Vict. pl. clxxi.

Ablepharus egeriae, n. sp., BOULENGER, P. Z. S. 1888, p. 535, Christmas I., Indian Ocean.

Eumeces xanthi, n. sp., GÜNTHER, Ann. N. H. (6) iv, p. 220, Ichang, China.

Ophiomorus, D. & B.: the genus monographed by BOULENGER, Bull. Soc. Z. Fr. 1887, pp. 519-534 (1888).

Chalcides ocellatus, Forsk., *lineatus*, Leuck., and *mionecton*, Bttg.: remarks on Moroccan specimens; *id.* Ann. N. H. (6) iii, pp. 304 & 305. *Gongylus melanogastricus*, Burm., = *Chalcides viridanus*, Gravh.; *id.* P. Z. S. 1889, p. 143.

Sepsina frontoparietalis, n. sp., *id.* Ann. N. H. (5) iv, p. 244, Madagascar.

Pseudacantius, n. g. Teeth conical; palate toothless; lower eyelid scaly; no ear-opening; nostril between three shields: rostral, supranasal, and first labial; a frontonasal; no præfrontals or frontoparietals; body much elongate, limbless. *P. madagascariensis*, n. sp., BOCAGE, J. Sci. Lib. (2) i, p. 125, fig., Madagascar.

Acontias sarasinorum, n. sp., F. MÜLLER, Verh. Ges. Basel, viii, p. 702, pl. x, Ceylon.

RHYPTOGLOSSA.

Chamaeleon cucullatus, Gray: note on the male; BOULENGER, Ann. N. H. (5) iv, p. 244. *C. caffer*, n. sp., BÄTTGER, Ber. Senck. Ges. 1889, p. 292, Pandoland, Caffraria.

PYTHONOMORPHA.

DOLLO, L. Première Note sur les Mosasauriens de Mesvin. Bull. Soc. Belg. Geol. iii, pp. 271-304, pls. ix & x.

Preliminary descriptions and figures of the skulls of the following new forms from the Upper Cretaceous of Mesvin, near Mons, Belgium:—

Mosasaurus lemonnieri, n. sp., p. 274, pl. ix, fig. 2.

Phosphorosaurus ortliebi, n. g. & sp., p. 279, pl. ix, fig. 6.

Oterognathus houzeaui, n. g. & sp., p. 286, pl. x, fig. 14.

Prognathosaurus solvayi, n. g. & sp., p. 293, pl. ix, fig. 4. The name *Prognathodon*, first proposed for this new genus in a preliminary note, *i. c.* p. 214, being preoccupied, is changed to *Prognathosaurus*.

Figures are also given of the skull of *Mosasaurus camperi*, Cuv., pl. ix, fig. 1, and of the nearly complete skeleton of *Hainosaurus bernardi*, Dollo, pl. x, fig. 1.

OPHIDIA.

TYPHLOPIDÆ.

Helminthophis petersii, p. 360, Guayaquil, and *guentheri*, p. 361, Porto Real, Rio Janeiro, n. spp., BOULENGER, Ann. N. H. (6) iv.

Typhlops leucoproctus, p. 361, Fly River, New Guinea, and Murray I., Torres Straits, *comorensis*, p. 361, Comoro Is., *socotranus*, p. 362, Socotra, *torresianus*, p. 362, Murray I., Torres Straits, *reginae*, p. 362, Queensland, *blanfordii*, p. 363, Abyssinia, and *affinis*, p. 363, Queensland, n. sp. BOULENGER, t. c.

BOIDÆ.

Lichanura, Cope : notes by STEJNEGER, P. U. S. Nat. Mus. xi, pp. 95-99. *L. orcutti*, p. 96, fig., Colorado Desert, and *simplex*, p. 97, fig., San Diego, California, n. spp., *id. ibid.*

COLUBRIDÆ.

Ablabes chinensis, n. sp., GÜNTHER, Ann. N. H. (6) iv, p. 220, Ichang, China. [= *A. collaris*, Gray.—REC.]

Coronella austriaca, Laur. : on its occurrence in Mecklenburg: C. STRUCK, Arch. Ver. Mecklemb. xlii, p. 189. *C. amaliae*, Bttg. : this Snake originally described as a *Rhinechis*, is intermediate between *C. austriaca* and *C. girondica*; BOULENGER, Ann. N. H. (6) iii, p. 305.

Ophibolus doliatus, L. : a discussion and synopsis of the subspecies: COPE, P. U. S. Nat. Mus. xi, p. 381. *O. doliatus nyspilus*, p. 381, Kansas, and *parallelus*, p. 385, Florida, n. subsp., *id. t. c.*

Aporophis, Cope, cannot be retained as distinct from *Ophiomorphus*: *id. op. cit.* xii, p. 144.

Lytorhynchus ridgewayi, Blgr., figured by BOULENGER, Tr. L. S. (2) v, pl. xi, fig. 1.

Pityophis deppii, Jan. : on the sound produced by this Snake; HERRERA, Nat. Mex. (2) i, p. 281, fig.

Coluber, L. : the type of this genus, as restricted by Cope, is *C. aspidopii*, Gm. ; COPE, P. U. S. Nat. Mus. xi, p. 389. *C. obsoletus lemniscatus*, p. 386, and *C. guttatus sellatus*, p. 387, n. subsp., and *C. rosaceus*, n. sp., p. 388, *id. t. c.*, Florida.

Natrix compressicauda bivittata, n. subsp., *id. t. c.* p. 392, Florida.

Tropidonotus swinhonis, Gthr. : on a variety from Ichang; GÜNTHER, Ann. N. H. (6) iv, p. 221.

Etonia, B. & G. : on the species of South-Eastern Indiana: COPE, P. U. S. Nat. Mus. xi, pp. 399-401. *E. sirtalis graminea*, n. subsp., p. 399. *E. butleri*, n. sp., p. 399, and *E. radix melanotania*, n. subsp., *id. t. c.*, Indiana.

Amphiardis, n. g., for *Virginia inornata*, Garm. ; *id. t. c.* p. 391.

Gonophis, n. g., for *Regina kirtlandi*, Kenn. ; *id. t. c.* p. 391.

Gononotus, n. g., allied to *Heterolepis*, but distinguished by the absence of loreal shield, the angular shape of the back, and the number 21 of rows of scales. *G. brussaui*, n. sp., MOCQUARD, Bull. Soc. Philom. (2) iv, p. 146, pl. ii, Loudinia-Niari, Congo.

Elapomorphus trilimatus, n. sp., BOULENGER, Ann. N. H. (6) iv, p. 266, Camapuam River, Brazil.

Naja oxiana, Eichw. : remarks by BOULENGER, Tr. L. S. (2) v, p. 107, pl. xi, fig. 2.

VIPERIDÆ.

*KAUFMANN, M. Du venin de la Vipère. Paris: 1889, 4to, 60 pp.

Vipera berus, L. : on its occurrence in Livonia, and on the effects of its bite : O. V. LOEWIS, Zool. Gart. xxx, p. 129. On its occurrence in Saxe Altenburg : G. WESEL, MT. Osterlande (2) iv (1888), p. 81. *V. heraldica*, n. sp., BUCAGE, J. Sci. Lisb. (2) i, p. 127, Angola.

GARMAN, S. On the Evolution of the Rattlesnake. P. Bost. Soc. xxiv, pp. 170-182, pl. i.

Trionocephalus lanceolatus, Merr. : notes on its habits and distribution in the West Indies (Martinique and St. Lucia) ; W. DUNCAN, P. Bristol Soc. (2) vi, p. 44.

Trimeresurus xanthomelas, n. sp., GÜNTHER, Ann. N. H. (6) iv, p. 221, Ichang, China. [= *T. jerdoni*, Gthr.—REC.].

Bothrops quadriscutatus, n. sp. (non Peters), POSADA-ARANGO, Bull. Soc. Z. Fr. xiv, p. 345, Colombia.

Thanatophis, n. g. [= *Bothriopsis*, Peters], *id. t. c. p.* 343. *T. patoquilla*, p. 343 [= *B. nigrorividis*, Ptrs., R. BLANCHARD, *t. c. p.* 347], *sutus*, p. 344, *montanus*, p. 344 [= *B. quadriscutatus*, Ptrs., BLANCHARD], *torvus*, p. 345 [= *B. schlegeli*, Berth., BLANCHARD], n. spp.; *id. ibid.*, Colombia. Critical remarks by R. BLANCHARD, *t. c. p.* 346-348.

ORNITHOSAURIA.

G. BAUR, Geol. Mag. (3) vi, pp. 171-174, makes some remarks on E. T. Newton's paper on the Skull and Brain of *Scaphognathus* [cf. Zool. Rec. xxv, Rept. p. 16].

DINOSAURIA.

MARSH, O. C. Comparison of the Principal Forms of Dinosauria of Europe and America. Geol. Mag. (3) vi, pp. 204-210, and Am. Journ. (3) xxxvii, pp. 323-331.

Iguanodon fittoni, p. 354, and *hollingtoniensis*, p. 355, n. spp., LYDEKKER, Geol. Mag. (3) vi, Wadhurst Clay, near Hastings.

Cumnoria, Seeley, = *Camptosaurus*, Marsh ; *id. Q. J. Geol. Soc.* xlv, p. 47.

Camptosaurus leedsi, n. sp., for a femur from the Oxford Clay near Peterborough ; *id. t. c. p.* 47, fig.

Cryptodraco, n. n. for *Cryptosaurus*, Seeley, nec Geoffroy ; *id. t. c. p.* 46.

Hadrosaurus breviceps, p. 335, fig., and *paucidens*, p. 336, n. spp., MARSH, Am. Journ. (3) xxxvii, Laramie Formation, Montana.

Syngonosaurus macrocercus, Seeley : notes on vertebræ apparently referable to this species, and indicating a Dinosaur allied to *Hylæosaurus* ; LYDEKKER, Q. J. Geol. Soc. xlv, p. 41, fig.

Orinosaurus capensis, n. sp., *id. Geol. Mag.* (3) vi, p. 353, Karoo System, S. Africa.

E. D. COPE, *Am. Nat.* xxiii, pp. 715-717, writes on the Horned Dinosauria of the Laramie Formation (*Agathummas*, Cope, *Polygonar*, Cope, *Monoclonius*, Cope).

Monoclonius recurvicornis, p. 716, pl. xxxiv, *sphenocerus*, p. 716, pl. xxxiii, fig. 2, and *fissus*, p. 717, n. spp., *id. ibid.*

E. D. COPE, *Science*, xiii, p. 290, refers the horncore described by Marsh as *Bison alticornis*, in 1887, to the Dinosaurian genus *Polygonar*, Cope.

Ceratops horridus, n. sp., MARSH, *Am. Journ.* (3) xxxvii, p. 334. Laramie formation, Wyoming and Colorado.

Triceratops, n. g., for *Ceratops horridus*; *id. op. cit.* xxxviii, p. 173. *T. flabellatus* and *galeus*, n. spp., *id. t. c.* p. 174, Laramie Formation, Colorado. The skull of *T. flabellatus* described and figured, p. 501, pl. xii.

Nodosaurus, n. g., allied to *Stegosaurus*, Marsh. *N. textilis*, n. sp., *id. t. c.* p. 175, fig., Middle Cretaceous, Wyoming.

Anchisaurus major, n. sp., *id. t. c.* p. 331, fig., Sandstone of the Connecticut River Valley.

Arctosaurus osborni, Adams: notes by LYDEKKER, *Geol. Mag.* (3) vi, p. 352, fig.

Megalosaurus oiceni, n. sp., *id. t. c.* p. 325, Wealden, England.

Cœlophysis, n. g., for *Cœlurus longicollis*, Cope, *bauri*, Cope, and *willsoni*, Cope; COPE, *Am. Nat.* xxiii, p. 626.

Calamospondylus, n. g., allied to *Cœlurus*. *C. fori*, n. sp., LYDEKKER, *Geol. Mag.* (3) vi, p. 119, fig., Wealden, Isle of Wight.

Hoplosaurus, Gervais, 1852, = *Ornithopsis*, Seeley, 1870; LYDEKKER, *Q. J. Geol. Soc.* xlv, p. 245. On a tooth probably of that genus, from the Wealden of Kent; *id. t. c.* p. 243, fig.

Ornithopsis hulkei, Seeley, = *Pelorosaurus armatus*, Gerv.; *id. Geol. Mag.* (3) vi, p. 325.

On the pelvis of *Ornithopsis*; SEELEY, *Q. J. Geol. Soc.* xlv, pp. 321-327, figs.

Morosaurus lentus, p. 333, fig., and *agilis*, p. 334, fig., n. spp., MARSH, *Am. Journ.* (3) xxxvii, Upper Jurassic, Wyoming and Colorado.

Pleurocalus valdensis, n. sp., LYDEKKER, *Geol. Mag.* (3) vi, p. 325. Wealden, England.

R. LYDEKKER, *Q. J. Geol. Soc.* xlv, p. 44, fig., remarks on the axis-vertebra of a Theropodous (?) Dinosaur, from the Wealden of the Isle of Wight, possibly referable to *Megalosaurus*, or to a nearly allied form.

EMYDOSAURIA.

BOULENGER, G. A. Catalogue of the Chelonians, Rhynchocephalians, and Crocodiles in the British Museum (Natural History). London: 1889, 8vo, x, 311 pp.

Recent Crocodiles are referred to a single family, *Crocodylidae*, divided into 6 genera and 23 species. 18 species are represented in the British Museum by 236 specimens.

E. KOKEN, Z. geol. Ges. 1888, p. 763, discusses the classification of the Crocodilians, criticizing Lydekker's recent arrangement, and showing that the *Parasuchia* of Huxley are widely different from all other Crocodilia, and approach nearer the Lacertilia (inclusive of *Rhynchocephalia*), and denies any direct genetic relationship of the *Parasuchia* to the *Mesosuchia*.

HULKE, J. W. Contribution to the Skeletal Anatomy of the *Mesosuchia*, based on fossil Remains from the Clays near Peterborough, in the Collection of A. Leeds, Esq. P. Z. S. 1888, pp. 417-442, pla. xviii & xix.

Deals with *Metriorhynchus* and *Steneosaurus*.

EISLER, P. Zur Kenntniss der Histologie des Alligatormagens. Arch. Mikr. Anat. xxx, pp. 1-10, pl. i.

DUGÈS, A. Bolsas glandulosas de los Crocodilos. Nat. Mex. (2) i, pp. 206 & 207, pl. xviii.

Garialis dizoni, Ow. (foss.): note by G. SMETS, Ann. Soc. Brux. xii (1888), p. 191.

Thoracosaurus macrorhynchus, Blainv. (foss.): description of a cranium; KOKEN, Z. geol. Ges. 1888, p. 754, pl. xxxii. The genus *Thoracosaurus*, Leidy, to which *Garialis macrorhynchus* is referred, is regarded as intermediate between *Garialis* and *Tomistoma*.

On *Steneosaurus*-remains from Parmilieu, Isère, France; LARRAZET, Bull. Soc. géol. (3) xvii, p. 8, pls. i & ii.

Geosaurus, Cuv. [= *Ducosaurus*, Quenst.], (foss.): notes by LYDEKKER, Q. J. Geol. Soc. xlv, p. 56.

CHELONIA.

BOULENGER, G. A. Catalogue of the Chelonians, Rhynchocephalians, and Crocodiles in the British Museum (Natural History). London: 1889, 8vo, x, 311 pp., 6 pls., and numerous woodcuts.

201 species of recent Chelonians are regarded as well established, 176 of which are represented in the British Museum by 1665 specimens. The following classification is followed:—

Subord. I. ATHECÆ.

Fam. 1. *Sphargidæ*.

Subord. II. THECOPHORA.

Superfam. I. CRYPTODIRA.

Fam. 2. *Chelydridæ*; 3. *Dermatemydidæ*; 4. *Cinosternidæ*;
5. *Platysternidæ*; 6. *Testudinidæ*; 7. *Chelonidæ*.

Superfam. II. PLEURODIRA.

Fam. 8. *Pelomedusidæ*; 9. *Chelydridæ*; 10. *Carettochelydridæ*.

Superfam. III. TRIONYCHOIDEA.

Fam. 11. *Trionychidæ*.

LYDEKKER, R. Catalogue of the Fossil Reptilia and Amphibia in the British Museum (Natural History). Part III. Chelonian. London: 1881, 8vo, xviii, 239 pp., numerous woodcuts.

Deals only with the specimens preserved in the British Museum. The above classification is followed on the whole, but the terms *Atheca* and *Thecophora* are changed to *Athecata* and *Testudinata*, and a group *Amphichelyida* (established by the author in Q. J. Geol. Soc. xlv, p. 518), equivalent to, and intermediate between *Cryptodira* and *Pleurodira*, embraces the extinct family *Pleurosternidae*.

G BAUR, Zool. Anz. xii, pp. 40-45, has notes on the osteology of the Chelonian, dealing with the epipterygoid, the number of costal plates, the marginals and nuchals, the cervical vertebræ, and other points in marine Turtles.

R. LYDEKKER, Rec. Geol. Surv. Ind. xxii, pp. 56-58 & 209-212, has notes on the nomenclature and synonymy of some Siwalik and Nerbada fossil Chelonians.

TRIONYCHOIDEA.

The term *Chilote* (Wiegman) is revived by BAUR Zool. Anz. xii, p. 241. for the group comprising the *Trionychide*.

STOFFERT, A. T. Bau und Entwicklung der Schale von *Emys ceylonensis*, Gray. Basel: 1889, 8vo, 26 pp., 4to atlas, 14 pls.

Trionyx pliopedemontana, n. sp. (foss.), SAUCCO, Mem. Acc. Tor. (?) xxxix. p. 458, Tertiary, Piedmont.

Trionyx bowerbanki, n. sp. (foss.), LYDEKKER, Cat. foss. Rept. iii, p. 19, Middle Eocene of Bracklesham, Sussex.

Aulacochelys, n. g. for *Trionyx circumsulcatus*, Owen (foss.): LYDEKKER, Ann. N. H. (6) iii, p. 53. BAUR, t. c. p. 273, demurs to this generic separation.

PLEURODIRA.

Sternotherus sinuatus, Smith, recorded from Madagascar by BETTGER. Ber. Senck. Ges. 1889, p. 296.

Dacochelys, n. g. (allied to *Podocnemis*?), for *Emys delabeckii*, OW. (foss.), of which a mandible apparently referable to the shell so named is described and figured; LYDEKKER, Q. J. Geol. Soc. xlv, p. 241, fig.

Chelodina noron-guinea, Blgr., figured by BOULENGER, Cat. pls. v & vi.

Plesiochelys brodiei, n. sp. (foss.), LYDEKKER, Q. J. Geol. Soc. xlv, p. 238, figs., Wealden, England.

Pleurosternum, OW. (foss.): LYDEKKER discusses the affinities of this genus: t. c. pp. 513-518, figs. *P. portlandicum*, n. sp. (foss.), *id.* Cat. foss. Rept. iii, p. 215, Portland Oolite, Dorsetshire.

Hydrochelys, n. g. for *Pleurosternum latiscutatum*, Owen (foss.), and allies; *id.* Q. J. Geol. Soc. xlv, p. 513.

Miolania, OW. (foss.): the systematic position discussed by BAUR, Ann. N. H. (6) iii, p. 54, who comes to the conclusion that these Tortoises

represent a highly specialized branch of the family *Testudinidae*. BOULENGER adheres to his former opinion that the *Miolaniidae* belong to the *Pleurodira*; *t. c.* p. 138, figs. Further remarks by BAUR, *op. cit.* iv, p. 37, pl. vi.

Rhinochelys, Seeley (foss.): notes by LYDEKKER, Q. J. Geol. Soc. xlv, p. 227. *R. cantabrigiensis*, p. 230, fig. 2, *macrorrhina*, p. 230, fig. 7, *elegans*, p. 230, fig. 4, *brachyrhina*, p. 231, fig. 3, and *jessoni*, p. 231, fig. 6, n. spp., *id. t. c.* pl. viii, Cambridge Greensand.

CRYPTODIRA.

Testudo, L.: Notes on the Tortoises of Great Namaqualand, *T. pardalis*, Bell, p. 281, *verreauxii*, Smith, p. 282, *trimeni*, Blgr., p. 283, *tentoria*, Bell, p. 284, *smithii*, Blgr., p. 285, and *angulata*, Schweigg., p. 286; BÆTTGER, Ber. Senck. Ges. 1889. *T. schweiggeri*, Gray, pls. ii & iii, and *smithii*, Blgr., pl. iv, figured by BOULENGER, Cat. *T. yniphora*, Vaill., described and figured by VAILLANT, N. Arch. Mus. (3) i, p. 61, pls. xii-xiv. *T. cautleyi*, p. 86, Pliocene of the Siwalik Hills, India, *punjabiensis*, p. 87, Punjab, and *sloanei*, p. 89, Tertiary, Turkey, n. spp. (foss.), LYDEKKER, Cat. foss. Rept. iii. *T. australis* and *formosa*, n. spp. (foss.), MORENO, Boll. Mus. la Plata, 1889, p. 29, Monte Hermoso, Argentine Republic. *T. crassiscutata*, n. sp. (foss.), LEIDY, Tr. Wagner Inst. Philad. p. 31, Peace Creek, Florida. **T. laurae*, n. sp. (foss.), B. FORSTER & H. BECKER, MT. Comm. geol. Landes-Unters. Elsass-Lothr. i, 1888, pl. —, Lower Oligocene, near Mülhausen [cf. J.B. Mineral. 1890, i, p. 141].

Cinirys belliana, Gray, recorded from Madagascar by BÆTTGER, Ber. Senck. Ges. 1889, p. 295.

Ptychogaster pomeli, p. 97, and *cayluxensis*, p. 98, n. spp. (foss.), LYDEKKER, Cat. foss. Rept., Oligocene, France.

Chaibassia, Theob., = *Nicoria*, Gray; *id.* J. A. S. B. lviii, p. 327. *C. tricarinata*, Blyth (= *theobaldi*, Aud.), described and figured; *id. ibid.* *C. tricarinata*, n. var. *sivalensis*, for a shell from the Pliocene of the Siwalik Hills; *id. t. c.* p. 333.

Pulchrochelys, H. v. Mey. *Emys portinii*, n. sp. (foss.), SACCO, Mem. Acc. Tor. (2) xxxix, p. 433, pls. i & ii, Tertiary, Piedmont.

Cistudo carolina, L., occasionally enters the water; SHUFELDT, Nature, xl, p. 644.

Emys euglypha, n. sp. (foss.), LEIDY, P. Ac. Philad. 1889, p. 97, Numulitic Limestone, Florida.

Ocadia oweni, n. sp. (foss.), LYDEKKER, Cat. foss. Rept. iii, p. 115, Upper Eocene, England and France.

Kashuga smithii, Gray, figured by BOULENGER, Cat. pl. i.

Thalassemys ruetimyeri, n. sp. (foss.), LYDEKKER, Cat. foss. Rept. iii, p. 149, Purbeck of Swanage, Dorsetshire.

Chelone jessoni, n. sp. (foss.), *id.* Q. J. Geol. Soc. xlv, p. 231, Chalk of Kent and Cambridge Greensand. *C. vanbenedenii*, Smets, and *walterkeynii*, Van Ben. (foss.), described by G. SMETS, Ann. Soc. Brux. xii (1888), pp. 125 & 209, figs.

Thalassochelys eocenica, n. sp. (foss.), LYDEKKER, P. Geol. Asa xi p. 177, Middle Eocene of Bracklesham, Sussex.

Argillochelys, n. g., near *Thalassochelys*, but with four costal shields: for *Chelone antiqua*, König (foss.), and allies; *id.* Q. J. Geol. Soc. xlv p. 236.

Lytoloma crassicoatum, Owen (foss.): description and figure of a skull; LYDEKKER, P. Z. S. 1889, p. 60, pl. vi. The genus *Lytoloma*, Cope (= *Euclastes*, Cope, preoccupied) is regarded as a member of the family *Chelonidae*, nearly allied to the existing genus *Thalassochelys*. *L. cantabrigiense*, n. sp. (foss.), *id.* Q. J. Geol. Soc. xlv, p. 233, figs., Cambridge Greensand.

Protochelys, n. g., for *Testudo stricklandi*, Phillips (foss.); *id.* Cat. foss. Rept. iii, p. 220.

Stegochelys, n. g., for *Chelone planiceps*, Owen (foss.); *id.* t. c. p. 233.

Notochelone, n. n. for *Notorchelys*, Ow., nec Gray; *id.* Geol. Mag. (3) vi. p. 325.

Anostira, Leidy, and *Pseudotrionyx*, Dollo (foss.): remarks on their systematic position; BAUR, Ann. N. H. (6) iii, p. 274.

Anostira anglica, n. sp. (foss.), LYDEKKER, t. c. p. 54, Upper Eocene. Hordwell. Not distinguishable from *A. radulata*, Cope, according to BAUR, t. c. p. 273.

Trachyaspsis ægyptiacus, p. 53, Suez, and *kantonensis*, p. 54, Upper Eocene, Hordwell, n. spp. (foss.); LYDEKKER, t. c.

Platychelys (?) *anglica*, n. sp. (foss.), *id.* Cat. foss. Rept. iii, p. 217, Purbeck, Dorsetshire.

INCERTÆ SEDIS.

Archæochelys, n. g., for plastral bones showing an unusual multiplication of horny shields. *A. valdensis*, n. sp. (foss.), LYDEKKER, Geol. Mag. (3) vi, p. 371, and Q. J. Geol. Soc. xlv, p. 511, figs., Wealden of Cuckfield, Sussex.

Psammocheilus keuperina, n. g. & sp. (foss.) [= *Proganochelys quenstedtii* Baur], QUENSTEDT, JH. Ver. Württ. xxxv, p. 120, pls. i & ii, Keuper, Württemberg.

ATHECÆ.

On the systematic position of *Dermochelys*; BAUR, Biol. Centralbl. ix, pp. 149-153, 180-191, 618, & 619.

Protostega anglica, n. sp. (foss.), LYDEKKER, Cat. foss. Rept. iii, p. 229, Chalk, England.

Eosphargis, n. g., for *Chelone gigas*, Owen (foss.), *id.*, Q. J. Geol. Soc. xlv, p. 241.

ICHTHYOSAURIA.

LYDEKKER, R. Catalogue of Fossil Reptilia and Amphibia in the British Museum (Natural History). Part II, containing the Orders *Ichthyopterygia* and *Sauropterygia*. London: 1889, 8vo, 307 pp., woodcuts.

Ichthyosaurus intermedius, Conyb. : on a paddle showing the contour of the integuments; LYDEKKER, Geol. Mag. (3) vi, p. 388, fig. *I. ætlandicus*, Seeley, is distinct from *I. acutirostris*, Ow.; *id. t. c.* p. 44.

H. G. SEELEY, Rep. Brit. Ass. 1888, p. 677, remarks on an *Ichthyosaurus* from Mombasa, E. Africa, and on the vertebral characters of the genus.

Temnodontosaurus, n. g., for *Ichthyosaurus platyodon*; LYDEKKER, Man. Pal., Addenda to Part III, p. xi.

PLESIOSAURIA.

LYDEKKER, *suprà*.

Cimoliosaurus cantabrigiensis, p. 183, fig. 1, Cambridge Greensand, *valdensis*, p. 188, fig., Wealden of England and Germany, *richardsonii*, p. 240, fig., Oxford Clay, and *brevior*, p. 243, fig. 1, Kimeridge Clay of Weymouth, n. spp., LYDEKKER, Cat. foss. Rept. ii.

Plesiosaurus indicus, Lyd., is referred to the Genus *Thaumatosauros*; *id.*, Rec. Geol. Surv. Ind. xxii, p. 49, fig.

Peloneustes, n. g., for *Plesiosaurus philarchus*, Seeley; *id.*, Q. J. Geol. Soc. xlv, p. 49. Various remains are figured in the text.

Nothosaurus, H. v. Mey : on remains from the Muschelkalk of Silesia, showing the vertebral column and plastron; H. KUNISCH, Z. geol. Ges. xl (1888), pp. 671-693, pls. xxix & xxx.

RHYNCHOCEPHALIA.

BOULENGER, G. A. Catalogue of the Chelonians, Rhynchocephalians, and Crocodiles in the British Museum. (*Cf. suprà*.)

A single recent representative : *Sphenodon punctatus*, Gray.

On the parasphenoid of *Sphenodon*; G. BAUR, Zool. Anz. xii, p. 45.

Palæohatteria, Credn. Remarks by BOULENGER, Nature, xxxix, p. 562, COPE, Am. Nat. xxiii, p. 148, and BAUR, Am. Journ. (3) xxxvii, p. 310. Boulenger and Baur agree to regard this genus as the type of a family distinct from the *Sphenodontidæ*, which the latter proposes to call *Palæohatteriidæ* or *Palæosphenodontidæ* (the new name *Palæosphenodon* being suggested), and to place with the *Mesosauridæ* in his order *Proganosauria*. Cope also regards it as a member of the *Proganosauria*, and probably of the family *Stereosternidæ*.

Kadaliosaurus, n. g., type of a new family related to the *Palæohatteriidæ* and *Proterosauridæ*. *K. priscus*, n. sp. (foss.), CREDNER, Z. geol. Ges. xli, p. 319, pl. xv, Permo-Carboniferous, Niederhäslich, near Dresden.

ANOMODONTIA.

SEELEY, H. G. Researches on the Structure, Organization, and Classification of the Fossil Reptilia. vi. On the Anomodont Reptilia and their Allies. Phil. Tr. clxxx, pp. 215-296, pls. ix-xxv.

1889. [VOL. XXVI.]

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Dicynodon copei, n. sp., SEELEY, t. c. p. 241, pl. xiv, S. Africa.
D. (Tropidostoma, n. subg.) duanui, n. sp., *id. ibid.* p. 232, pl. xii
 S. Africa.

Hyorhynchus platyceps, n. g. & sp., SEELEY, t. c. p. 242, pl. xv,
 figs. 1-3, S. Africa.

Eurycarpus oweni, n. g. & sp., SEELEY, t. c. p. 259, pl. xviii, S. Africa.

Dicynodon simocephalus, n. sp., WEITHOFER, Ann. Hofmuseum
 Wien, iii (1838), pl. 1, Karroo Formation.

BATRACHIA.

The Batrachians are arranged thus by HAECKEL, *supra* (p. 1), p. 625 :—

Subclass.	Legion.	Order.
PHIRACTAMPHIBIA . .	<i>Stegocephala</i> <i>(Archamphibia)</i>	1. <i>Archegosauria</i> .
		2. <i>Mastodonsauria</i> .
	<i>Peromela</i> <i>(Pseudophidia)</i>	3. <i>Microsauria</i> .
		4. <i>Aristopoda</i> .
LISSAMPHIBIA . . .	<i>Urodela</i> <i>(Caudata)</i>	5. <i>Gymnophiona</i> .
		6. <i>Perennibranchia</i> .
		7. <i>Cryptobranchia</i> .
		8. <i>Caducibranchia</i> .
	<i>Anura</i> <i>(Batrachia</i> <i>s. Ecaudata).</i>	9. <i>Aglossa</i> .
		10. <i>Bufonacea</i> .
		11. <i>Callulacea</i> .
		12. <i>Banacea</i> .
		13. <i>Hylacea</i> .

HOWES, G. B., & DAVIES, A. M. Observations upon the Morphology and Genesis of Supernumerary Phalanges, with especial reference to those of the Amphibia. P. Z. S. 1888, pp. 495-511, pls. xxiv & xxv.

The authors conclude that the supernumerary phalanx of the *Ecaudata* is a true phalanx, and, at the same time, structurally identical with the inter-phalangeal syndesmosis of these and other Batrachians; and that the *Discoglosside* are exceptional among the *Ecaudata* in the retention for life of the undifferentiated inter-articular syndesmoses—an additional proof of their lowly affinities.

M. IVERSEN, Anat. Anz. ix, p. 94, draws attention to the peculiar distal expansion of the first rib in *Salamandra*, which is connected by fibrous tissue with the scapular arch. He points out that the element of the shoulder-girdle of *Stegocephala*, named by Credner "Scapula," is such a dilated rib; hence the "clavicula" of that author would prove to be homologous with the Scapula of recent Urodeles.

STÜVE, R. Beitrag zur Kenntniss des Baues der Eileiterdrüsen bei den Amphibien. Arch. mikr. Anat. xxxiv, pp. 123-131, pl. vi.

- RUGE, G. Vorgänge am Eifollikel der Wirbelthiere. 1. Rückbildung der nicht ausgestossenen Eierstockseier bei Amphibien. *Morph. J.B.* xv, pp. 491-554, pls. xviii-xxi.
- *SCHWINK, F. Ueber die Entwicklung des mittleren Keimblattes und der Chorda dorsalis der Amphibien. Munich : 1889, 8vo.
- SCHULTZ, P. Ueber die Giftdrüsen der Kröten und Salamander. Eine histologische Studie. *Arch. mikr. Anat.* xxxiv, pp. 11-57, pl. ii.
- *CHATIN, J. Contributions expérimentales à l'étude de la chromatopsie chez les Batraciens, les Crustacés et les Insectes. Paris : 1889, 8vo, 115 pp.
- CAMERANO, L. Ulteriori osservazioni intorno alla *Neotenia* negli Anfib. *Boll. Mus. Zool. Anat. Comp. Torino*, iv, No. 56.
- PERACCA, M. G. Intorno all'acclimamento di alcune specie di Batraci Urodeli ed Anuri in Italia. *Op. cit.* No. 62.

ECAUDATA.

- ECKER, A. The Anatomy of the Frog. Translated, with numerous Annotations and Additions, by G. HASLAM. Oxford : 1889, 449 pp., woodcuts, 2 pls.
- PARKER, W. N. On the occasional Persistence of the Left Posterior Cardinal Vein in the Frog, with remarks on the Homologies of the Veins in the Dipnoi. *P. Z. S.* 1889, pp. 145-151.
- SMIRNOW, A. Ueber die Nervenendigungen in der Froschlunge. *Protok. obsch. estest. Kazan*, 1888-89, No. 100, 6 pp. [Russian text].
- GEHUCHTEN, A. VAN. Les Noyaux musculaires de la Grenouille adulte. *Tag. 61. Deut. Nat. Vers.* pp. 46 & 47, and *Anat. Anz.* iv, pp. 52-64.
- HÉRON-ROYER, —, & VAN BAMBEKE, C. Le vestibule de la Bouche chez les Têtards des Batraciens anoures d'Europe ; sa structure, ses caractères chez les diverses espèces. *Arch. Biol.* ix, pp. 185-309, pls. xi-xxiv.
- KEIFFER, H. Recherches sur la structure et le développement des dents et du bec cornés chez *Alytes obstetricans*. *T. c.* pp. 55-81, pls. i & ii.
- SCHULZE, F. E. Ueber die inneren Kiemen der Batrachierlarven. 1. Mittheilung : Ueber das Epithel der Lippen, der Mund-, Rachen- und Kiemenhöhle erwachsener Larven von *Pelobates fuscus*. *Abh. Ak. Berl.* 1888, pp. 1-59, pls. i-iv.
- GUTZEIT, E. Die Hornzähne der Batrachierlarven. *Z. wiss. Zool.* xlix, pp. 43-70, pls. ii & iii.
- Researches based on *Rana temporaria*, *R. esculenta*, *Hyla arborea*, *Pelobates fuscus*.
- CAMERANO, L. Di alcuni *Girini albi* e delle cause dell' albinismo. *Boll. Mus. Zool. Anat. Comp. Torino*, iv, No. 64.
- Albino tadpoles of *Bufo viridis* and *Rana temporaria*.

- LOOSS, A. Ueber Degenerations-Erscheinungen im Thierreich, besonders über die Reduktion des Froschlarvenschwanzes und die im Verlaufe derselben auftretenden histolytischen Processe. *Preisachr. Jahn-novsk. Gesells. Leipzig*, xxvii, 116 pp., 4 pls.
- MASSART, J. Sur la pénétration des spermatozoïdes dans l'œuf de la Grenouille. *Bull. Ac. Belg.* (3) xviii, pp. 215-220.
- SCHULTZE, O. Ueber die Entwicklung der Medullarplatte des Froscheies. *Verh. Ges. Würzb.* (2) xxiii, pp. 1-28, pls. i & ii.
- BLOCHMANN, F. Eine einfache Methode zur Entfernung der Gallert- und Eischale bei Froscheiern. *Zool. Anz.* xii, pp. 269 & 270.
- HÉRON-ROYER, —. Des causes de la mortalité des femelles de Batraciens anoures à la suite d'un accouplement prolongé. *Bull. Soc. Z. Fr.* xiv, pp. 56 & 57.
- J. J. FLETCHER, P. Linn. Soc. N.S.W. (2) iv, pp. 357-387, has notes on the oviposition and habits of the Batrachians of New South Wales.
- F. A. A. SKUSE, *t. c.* pp. 171-177, has a paper on the Dipterous Insects parasitic upon Australian Frogs.

RANIDÆ.

Rana, L : notes on the brown frogs of Germany, *R. temporaria* (*f. s. a.* Rösel), *arralis*, Nilss., and *agilis*, Thomas; LEYDIG, *Zool. Anz.* xii, pp. 314-318. *R. boulengeri*, n. sp.; GÜNTHER, *Ann. N. H.* (6) iv, p. 222. Ichang, China. *R. flavicrus*, p. 245, *redimita*, p. 245, and *biporus*, p. 246 n. spp.; BOULENGER, *Ann. N. H.* (5) iv, Madagascar. *R. femoralis* Blgr., = *Pelypedates lugubris*, A. Dum.; *id. t. c.* p. 246.

Polypedates dispar, Bittg., = *P. tephromystax*, A. Dum.; *id. ibid.*

Racophorus, Kuhl. 3 species which have usually been confounded under the name of *R. maculatus*, Gray, are distinguished and characterized, viz., *R. leucomystax*, Gravenh. (S. China and E. Himalayas to the Malay Peninsula and Archipelago), *R. maculatus*, Gray (India and Ceylon), and *R. cruciger*, Blyth (Ceylon); *id. P. Z. S.* 1889, pp. 27-32, figs.

F. MOCQUARD, CR. Congrès intern. Zool. Paris, p. 80, remarks on a tadpole from Kina Balu, possibly referable to *Rhacophorus*, the mouth of which is modified into a sucker armed with teeth comparable to that of a Cyclostomous Fish.

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Ord. II. SELACHII.

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- Squatina crassidens*, n. sp. (foss.), *id. t. c.* p. 69, pl. ii, fig. 1, Upper Cretaceous, Mount Lebanon. *S. crassa*, p. ix, and *rupeliensis*, p. x, n. spp. (foss.), DAIMERIES, P.-v. Soc. Mal. Belg. xviii, Eocene, Belgium.
- ✓ *Sclerorhynchus*, n. g. (*Pristida* or *Pristiophoridae*), for *S. atavus*, n. sp. (foss.), A. S. WOODWARD, Cat. p. 76, pl. iii, fig. 1, Upper Cretaceous, Mount Lebanon.
- Rhinobatus bugesiacus*, Tholl. (foss.): notes and figure; *id. Geol. Mag.* (3) vi, p. 393.
- Raia equatorialis*, n. sp., JORDAN & BOLLMAN, P. U. S. Nat. Mus. xii, p. 150, Pacific Ocean, off coast of Colombia. *R. mamillidens*, n. sp., ALCOCK, Ann. N. H. (6) iv, p. 380, Gulf of Manaar, 597 fath. *R. prim- armata*, p. 85, pl. iv, figs. 1-3, Upper Cretaceous, Sahel Alma, Syria, and *similis*, p. 86, pl. iv, figs. 4 & 5, n. spp. (foss.), A. S. WOODWARD, Cat.
- Discopyge ommata*, n. sp., JORDAN & GILBERT, P. U. S. Nat. Mus. xii, p. 151, Pacific Ocean, off coast of Colombia.
- Psammodius salopiensis*, n. sp. (foss.), A. S. WOODWARD, Cat. p. 105, Carboniferous Limestone, Shropshire.
- Myliobatis* (?) *tumidens*, n. sp. (foss.), *id. t. c.* p. 119, Red Crag, Suffolk.
- Myliobatis thomasi*, n. sp. (foss.), SAUVAGE, Bull. Soc. géol. (3) xvii, p. 561, fig., Saccosian, Tunis.
- Rhinoptera daviesii*, n. sp. (foss.), *id. t. c.* p. 126, pl. iii, fig. 6, London Clay, Isle of Sheppey.
- Ptychodus multiatriatus*, n. sp. (foss.), *id. t. c.* p. 146, pl. v, figs. 4-6, Turonian and Senonian, S.E. England. *P. parvulus*, n. sp. (foss.), WHITE- AVES, Contr. Can. Pal. i, p. 191, pl. xxvi, fig. 5, Cretaceous, Manitoba.
- Urolophus goodiei*, n. sp., JORDAN & BOLLMAN, P. U. S. Nat. Mus. xii, p. 151, Pacific Ocean, off coast of Colombia.

ASTEROSPONDYLI.

✓ *Pleuroplax*, n. n. for *Pleuroodus*, Hanc. & Atth., nec Wood; A. S. WOODWARD, Cat. p. 173.

Psephodus salopiensis, p. 182, pl. vi, fig. 14, and *dubius*, p. 183, pl. vi, fig. 13, n. spp. (foss.), *id. t. c.*, Carboniferous Limestone, Shropshire.

Deltodus gibbus, p. 197, pl. vi, figs. 19 & 20, and *rugosus*, p. 198, pl. vi, figs. 21 & 22, n. spp. (foss.), *id. t. c.*, Carboniferous Limestone, England.

Cyrtodonus hornei, n. sp. (foss.), *id. t. c.*, Carboniferous Limestone, Yorkshire.

Ptychacanthus sublarvis, Ag., = *Tristychius larvis*, Ag. (foss.); TRAQUAIR, Geol. Mag. (3) vi, p. 27.

Ctenacanthus latispinosus, Whiteaves: redescribed by WHITEAVES, Tr. R. Soc. Canada, vi, p. 95, pl. x, fig. 3.

Homacanthus gracilis, n. sp., *id. t. c.* p. 96, pl. x, fig. 4. Lower Devonian, Campbellton, Canada.

Ctenacanthus latispinosus and *Homacanthus gracilis*, Whiteaves, belong to a single species of *Climacius*, which may retain the provisional name *Climacius latispinosus*; A. S. WOODWARD, Ann. N. H. (6) iv, p. 183.

Palæobates angustissimus, Ag.: revised synonymy; JAEKEL, Abh. Geol. Specialk. Elsass-Lothr. iii, p. 329.

Hybodus, Ag.: on a symmetrical Hybodont tooth from the Oxford Clay of Peterborough; A. S. WOODWARD, Ann. N. H. (6) iii, p. 300, pl. xiv, fig. 6. *H. keuperinus*, Murch. & Strickl. (foss.): remarks by A. S. WOODWARD, *t. c.* p. 297, pl. xiv, figs. 1-3. *H. levis*, n. sp. (foss.), *id. Cat.* p. 269, pl. xi, fig. 5, Bathonian, Oxfordshire. *H. multiconus*, p. 303, pl. vii, figs. 8 & 9, and *multiplicatus*, p. 307, pl. vii, fig. 10, n. spp. (foss.), JAEKEL, Abh. Geol. Specialk. Elsass-Lothr., Muschelkalk, Lorraine.

Polyacrodus, n. g., for *Hybodus polycephalus*, Ag.; *id. t. c.* p. 321.

Acrodus lateralis, Ag.: revised synonymy; *id. t. c.* p. 312. *A. acutatus*, n. sp. (foss.), A. S. WOODWARD, Cat. p. 296, pl. xiii, fig. 10, Wealden, Isle of Wight.

✓✓ *Hybodontus* and *Acrodontus*, n. nn. for the fossils known as *Ctenodus heteromorphus*, Ag., and which are evidently allied to *Hybodus* and *Acrodus*; FRAAS, JH. Ver. Württ. xxxv, p. 235. *H. infractus*, n. sp. 238, fig. 10, *trispinosus*, p. 238, fig. 11, and *pusillus*, p. 239, fig. 12, n. spp., *id. t. c.* pl. v, Keuper of Württemberg.

Palæospinus egerloni, n. sp. (foss.), A. S. WOODWARD, Cat. p. 324, Lower Lias, Württemberg.

Synechodus tenuis, n. sp. (foss.), *id. t. c.* p. 329, pl. xi, fig. 21, Neocomian, Kent.

Cestracion sulcatus, n. sp. (foss.), *id. t. c.* p. 333, pl. xiii, figs. 11 & 12, Cenomanian, Kent.

Palæoscyllium minus, n. sp. (foss.), *id. t. c.* p. 339, pl. xvi, fig. 4, Lithographic Stone, Bavaria.

Scyllium dubium, n. sp. (foss.), *id. t. c.* p. 341, pl. xvi, figs. 7 & 8, Turonian, Kent. *S. (?) tumidens*, n. sp. (foss.), *id. t. c.* p. 342, pl. xv, fig. 6, Upper Cretaceous, Mount Lebanon. *S. colineti*, n. sp. (foss.), DAIMERIES, P.-v. Soc. Mal. Belg. xviii, p. xlviii, Eocene, Belgium.

- ✓ *Paracentroscyllium*, n. g., allied to *Centroscyllium*. Two dorsal fins, each with a strong spine. No anal fin. Mouth crescentic, with a direct oblique groove at each angle. Teeth equal in both jaws, minute, simple, monocuspid, straight. No membrana nictitans. Gill-openings rather wide. Integument smooth. *P. ornatum*, n. sp., ALCOCK, Ann. N. H. (6) iv, p. 379, Bay of Bengal, 405–485 fath.
- ✓ *Cantioscyllium*, n. g., apparently allied to *Ginglymostoma*. *C. decipiens*, n. sp. (foss.), A. S. WOODWARD, Cat. p. 347, Turonian, Kent.
- Pristiurus hassei*, n. sp. (foss.), *id. t. c.* p. 344, Lithographic Stone, Bavaria.
- Ginglymostoma minuta*, n. sp. (foss.), DAIMERIES, P.-v. Soc. Mal. Belg. xviii, p. xlvi, Eocene, Belgium.
- ✓ *Orthacodus*, n. n. for *Sphenodus*, Ag., nec Gray; A. S. WOODWARD, Cat. p. 349.
- ✓ *Scapanorhynchus*, n. n. for *Rhinognathus*, Davis, nec Fairmaire; *id. t. c.* p. 351. *S. elongatus*, n. sp. (foss.), *id. t. c.* p. 353, Upper Cretaceous, Mount Lebanon. *S. (?) gigas*, n. sp. (foss.), *id. t. c.* p. 358, Cambridge Greensand.
- Lamna spallanzanii*, Bp.: note on a foetus; VAILLANT, Bull. Soc. Philom. (8) i, p. 38. *L. serra*, n. sp. (foss.), A. S. WOODWARD, Cat. p. 400, Danian, Mont Aimé, France. *L. manitobensis*, n. sp. (foss.), WHITEAVES, Contr. Can. Pal. i, p. 192, pl. xxvi, fig. 6, Cretaceous, Manitoba.
- Carcharias (Scoliodon) eocænus*, n. sp. (foss.), A. S. WOODWARD, Cat. p. 436, London Clay, Highgate. *C. (Aprionodon) gibbesii*, n. sp. (foss.), *id. t. c.* p. 437, Eocene, S. Carolina and Alabama.
- Galeocерdo vincenti*, n. sp. (foss.), DAIMERIES, P.-v. Soc. Mal. Belg. xviii, p. xlvii, Eocene, Belgium.

INCERTÆ SEDIS.

- ✓ *Protopirata*, n. g.; type, *P. centrodon*, n. n. for *Edestus protopirata*, Trd. (foss.); TRAUTSCHOLD, Z. Geol. Ges. xl, p. 750, fig.

HOLOCEPHALA.

- WOODWARD, A. S. On the *Myriacanthidæ*, an extinct Family of Chimaeroid Fishes. Ann. N. H. (6) iv, pp. 275–280.
- A new family, to include *Myriacanthus*, Ag., and *Chimaeropsis*, Zittel.
- Chimæra monstrosa*, L.: on the egg-capsule; GÜNTHER, *t. c.* p. 415, fig.

GANOIDEI.

PLACODERMI.

- TRAUTSCHOLD, H. Ueber *Coccosteus megalopteryx*, Trd., *Coccosteus obtusus*, and *Cheliophorus verneuili*, Ag. Z. geol. Ges. 1889, pp. 35–48, pls. iii–vi.
1889. [VOL. XXVI.]

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Homosteus, Asmuss, and *Coccosteus*, Ag. : remarks by TRAQUAIR, Geol. Mag. (3) vi, pp. 1-8, pl. i. *H. milleri*, n. sp., *id. t. c.* p. 8 (= *Asterolepis* sp., Hugh Miller).

Coccoseus acadicus, Whiteaves, redescribed and figured ; WHITEAVES, Tr. R. Soc. Canada, vi, p. 93, pl. ix.

Cephalaspis campbelltonianus, Whiteaves : redescribed by WHITEAVES, *t. c.* p. 92, pl. x, fig. 2.

Diplaspis acadica, Matthew, described, and its systematic position discussed ; MATTHEW, *t. c.* p. 49, pl. iv, figs. 1-4.

ACANTHODINI.

Acanthodes affinis, n. sp., WHITEAVES, Tr. R. Soc. Canada, vi, p. 91, pl. v, fig. 1, Upper Devonian, Scaumenac Bay, Canada. *A. lipatini*, p. 4, and *parvulus*, p. 7, n. spp., ROHON, Mém. Ac. Pétersb. xxxvi, No. 13, p. 4, pl. i, Devonian (?), Siberia.

Gyrolepidotus schmidtii, n. g. & sp., *id. t. c.* p. 8, Devonian (?), Siberia.

DIPNOI.

PARKER, W. N. On the occasional Persistence of the Left Posterior Cardinal Vein in the Frog, with Remarks on the Homologies of the Veins in the *Dipnoi*. P. Z. S. 1889, pp. 145-151.

SANDERS, A. Contributions to the Anatomy of the Central Nervous System in *Ceratodus forsteri*. Ann. N. H. (6) iii, pp. 157-188, pls. viii-xiii.

WOODWARD, A. S. Note on a Tooth of *Ceratodus* from the Stormberg beds of the Orange Free State, South Africa. *Op. cit.* iv, p. 243.

PARKER, W. N. Preliminary note on the Anatomy and Physiology of *Protopterus annectens*. Nature, xxxix, pp. 19-21.

Protopterus annectens, Ow. : notes on specimens in confinement ; E. BEAUREGARD, CR. Soc. Biol. (9) i, p. 556.

Dipterus macropterus, Traq. : notes and figure ; TRAQUAIR, Geol. Mag. (3) vi, p. 97, pl. ii.

CHONDROSTEL.

P. H. KIRSCH & M. W. FORDICE publish a review of the American *Acipenseride*. P. Ac. Philad. 1889, pp. 245-257.

WOODWARD, A. S. On the Palaeontology of Sturgeons. P. Geol. Ass. xi, pp. 24-44, figs., pl. i.

Pholidurus disjectus, n. g. & sp. (foss.), A. S. WOODWARD, *t. c.* p. 44, pl. i, figs. 4 & 5, Upper Chalk, Gravesend.

POLYPTEROIDEI.

BRIDGE, T. W. Some Points in the Cranial Anatomy of *Polypterus*. P. Birmingham. Phil. Soc. vi, pp. 118-130.

Rhaphiosaurus, Ow., is founded upon the anterior half of the dentary bone of a species of the Cretaceous fish *Pachyrhizodus*; A. S. WOODWARD, Ann. N. H. (6) iv, p. 350.

Saurichthys acuminatus, Ag.: on a maxilla from the Rhœtic of Aust Cliff, near Bristol; *id. op. cit.* iii, p. 301, pl. xiv, figs. 7 & 8.

Eusthenopteron foordii, Whiteaves, described and figured by WHITEAVES, Tr. R. Soc. Canada, vi, p. 78, pls. v, fig. 5, vi, & vii.

Glyptolepis quebecensis, n. sp., *id. t. c.* p. 77, pl. v, fig. 4, Upper Devonian, Province Quebec.

ROHON, J. V. Die Dendrodonts des devonischen Systems in Russland. Mém. Ac. St. Petersb. xxxv, No. 14.

The author regards *Dendrodus*, Ow., and *Cricodus*, Ag., as not Ganoids, but thinks they should be reckoned as forming a peculiar order of *Dipnoi*.

Criticisms by TRAQUAIR, Geol. Mag. (3) vi, pp. 490-492, who considers the *Dendrodontidæ* to be simply synonymous with the *Holoptychidæ*, a group of Crossopterygian Ganoids.

Onychodus arcticus, n. sp. (foss.), A. S. WOODWARD, Ann. N. H. (6) iv, p. 407, and Geol. Mag. (3) vi, p. 409, Devonian, Spitzbergen.

Osteolepis tscherskyi, n. sp., ROHON, *t. c.* p. 13, pl. ii, Devonian, Siberia.

LEPIDOSTEOIDEI.

BEARD, J. On the Early Development of *Lepidosteus osseus*. Preliminary Notice. P. R. Soc. xlv, pp. 108-118.

Histionotus angularis, Egert.: description and figure of a new specimen; MANSEL-PLEYDELL, Geol. Mag. (3) vi, p. 241, pl. vii.

Chirolepis canadensis, Whiteaves, redescribed and figured by WHITEAVES, *t. c.* p. 90, pl. viii.

Palæoniscus sibiricus, n. sp., for Triassic remains from the Upper Yenissei; ROHON, Mém. Ac. Pétersb. (7) xxxvi, No. 13: referred to *Colobodus* by A. S. WOODWARD, Ann. N. H. (6) iv, p. 107. *P. maacki*, p. 10, and *sibiricus*, p. 12, n. spp., ROHON, *t. c.*, Devonian (?), Siberia.

✓ *Atherstonia*, n. g., most nearly allied to *Gyrolepis* and *Rhabdolepis*. *A. scutata*, n. sp., A. S. WOODWARD, *t. c.* p. 239, pl. xiv, Karoo formation, S. Africa.

Lepidotus maximus, Wagn.: on its dentition, as illustrated by fossils from the Kimeridge Clay; ETHERIDGE & WILLETT, Q. J. Geol. Soc. xlv, p. 356, pl. xv.

AMIOIDEI.

Eurycormus grandis, n. sp., A. S. WOODWARD, Ann. N. H. (6) iv, p. 405, and Geol. Mag. (3) vi, p. 449, Kimmeridge Clay, Ely.

Hypsocormus leedsi, pp. 406 & 450, and *tenuirostris*, p. 451, n. spp., *id. t. c.*, Oxford Clay, Peterborough.

✓ *Leedsichthys problematicus*, n. g. & sp., *id. t. c.* pp. 406 & 451, Oxford Clay, Peterborough.

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✓ *Brouneichthys ornatus*, n. g. & sp., *id. t. c.* pp. 407 & 455, Lower Lias, Barrow-on-Soar.

TELEOSTEI.

GILL, T. On the Classification of the Mail-Cheeked Fishes. P. U. S. Nat. Mus. xi, pp. 567-592. [*Cf. Zool. Rec.* 1888, *Fishes*, p. 14.]

PILLIET, A. Contribution à l'Étude des Espaces Portes du Foie chez quelques Vertébrés. J. Anat. Phys. xxv, pp. 264-276.

The fish investigated is *Callionymus lyra*.

COGGI, A. Ueber den epithelialen Theil der sog. Blutdrüsen in der Schwimmblase des Hechtes (*Esox lucius*). Morph. JB. xv, pp. 555-559, pl. xxii.

AGASSIZ, A., & WHITMAN, C. O. The Development of Oseous Fishes. II. The Pre-embryonic Stages of Development. Part First: The History of the Egg from Fertilization to Cleavage. Mem. Mus. C. Z. xiv, pp. 1-40, pls. xx-xxxi.

CUNNINGHAM, J. T. Studies of the Reproduction and Development of Teleostean Fishes occurring in the neighbourhood of Plymouth. J. Mar. Biol. Ass. (2) i, pp. 10-54, pls. i-vi.

— Remarks on some Teleostean Ova, and their Development. Rep. Brit. Ass. 1888, pp. 703 & 704.

EIGENMANN, C. H. On the Development of California Food Fishes. Am. Nat. xxiii, pp. 107-110.

LAGUESSE, E. Développement du Pancréas chez les Poissons osseux. C.R. Soc. Biol. (9) i, pp. 341-343.

JUNGENSEN, H. F. E. Beiträge zur Kenntniss der Entwicklung der Geschlechtsorgane bei den Knochenfischen. Arb. Inst. Würsb. ix, pp. 89-219, pls. vii & viii.

LIST, J. H. Ueber die Beziehung der Harnblase zu dem Enddarme bei Teleostierembryonen (Labriden). Anat. Anz. iv, pp. 501-504, figs.

ACANTHOPTERYGII.

PERCIDÆ.

Lates macropterus, n. sp. (foss.), BASSANI, Atti Acc. Napoli (2) iii, p. 51, pl. iv, fig. 5, Lower Miocene of Chiavon.

Smerdis taramellii, n. sp. (foss.), *id. t. c.* p. 56, pl. v, figs. 2 & 3, Lower Miocene of Chiavon.

Ethiostoma rex, p. 357, pl. xiv, fig. 9, *roanoka*, p. 358, fig. 10, *parietemone*, p. 359, fig. 11, *varicundum*, p. 360, fig. 12, *scrannanoo*, p. 361, fig. 13, *longimana*, p. 361, fig. 14, and *australe*, p. 362, n. spp., JORDAN. P. U. S. Nat. Mus. xi, United States.

Centropomus grandoculatus, n. sp., JENKINS & EVERMANN, *t. c.* p. 13, Gulf of California.

Anthias cyclops, Blkr., and *pleurotenia*, Blkr., redescribed by DOUGLAS-GILBY, P. Z. S. 1889, pp. 151 & 153. *A. formosus*, n. sp., BOULENGER, t. c. p. 238, Muscat, Arabia.

Serranus praeopercularis, Blgr., and *gibbosus*, Blgr.: additional remarks, id. t. c. p. 244. *S. coromandelicus*, Day, redescribed by id. t. c. p. 237. *S. jayakari*, n. sp., id. *ibid.*, Muscat, Arabia. *S. assabensis*, n. sp. (P), GIGLIOLI, Ann. Mus. Genov. (2) vi, p. 68, Assab [= *S. areolatus*, Forsk.] *S. rudis*, n. sp. (foss.), BASSANI, Atti Acc. Napoli (2) iii, p. 63, pl. vi, fig. 2, Lower Miocene of Chiavon.

Epinophelus jordani, n. sp., JENKINS & EVERMANN, P. U. S. Nat. Mus. xi, p. 140, Gulf of California.

Diplectrum euryplectrum, n. sp., JORDAN & BOLLMAN, *op. cit.* xii, p. 157, Pacific Ocean, off coast of Colombia.

Prionodes stilbostigma, n. sp., *ibid.* t. c. p. 158, Pacific Ocean, off Coast of Ecuador.

Kuklia arge, n. sp., *ibid.* t. c. p. 159, Galapagos Archipelago.

Orthopristis lethopristis, n. sp., JORDAN & FESLER, P. Ac. Philad. 1889, p. 36, Galapagos Is.

Lutjanus viridis, Val., redescribed by JORDAN, P. U. S. Nat. Mus. xi, p. 330.

Diagramma jayakari, Blgr.: additional remarks by BOULENGER, P. Z. S. 1889, p. 245.

Aphareus rutilans, C. & V.: note by BOULENGER, t. c. p. 245.

Erythrichthys schlegelii, Gthr.: notes, id. t. c. p. 238.

Arrapis georgianus, C. & V., figured by MCCOY, Prodr. Zool. Vict. pl. clxxxiv.

Apogon maximus, Blgr.: additional remarks by BOULENGER, P. Z. S. 1889, p. 244. *A. krambergeri*, n. sp. (foss.), BASSANI, Atti Acc. Napoli (2) iii, p. 59, pl. v, fig. 4, Lower Miocene of Chiavon.

Priacanthus, Cuv.: on the American species; W. L. MORRISON, P. Ac. Philad. 1889, pp. 159-163.

Plioplarchus septemspinus, n. sp. (foss.), COPE, Am. Nat. xxiii, p. 625, Miocene, N. America.

SQUAMIPINNES.

Scatophagus copellinii, p. 86, pl. xvi, figs. 1 & 2, and *affinis*, p. 88, pl. xvi, fig. 3, n. spp. (foss.), BASSANI, Atti Acc. Napoli (2) iii, Lower Miocene of Chiavon.

Holacanthus piovenorum, n. sp. (foss.), id. t. c. p. 89, pl. xviii, fig. 2, Lower Miocene of Chiavon.

Pygæus zignoi, n. sp. (foss.), id. t. c. p. 93, pl. xvii, Lower Miocene of Chiavon.

SFÆRIDÆ.

Pagrus ruber, Blgr., = *P. spinifer*, Forsk.; BOULENGER, P. Z. S. 1889, p. 245. *P. meneghinii*, n. sp. (foss.), BASSANI, t. c. p. 69, pl. xv, fig. 1, Lower Miocene of Chiavon.

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Chrysosphrys zignoi, p. 71, pl. viii, figs. 1 & 2, and *scacchii*, p. 72, pl. xii, n. spp. (foss.), *id. t. c.*, Lower Miocene of Chiavon.

Sparnodus moloni, p. 66, pl. vii, fig. 1, and *intermedius*, p. 67, pl. vii, fig. 2, n. spp. (foss.), *id.*, Atti Acc. Napoli (2) iii, Lower Miocene of Chiavon.

Pimelepterus (Kyphosus) elegans, Peters, described by JENKINS & EVERMANN, P. U. S. Nat. Mus. xi. p. 142.

✓ *Hermosilla*, n. g., allied to *Pimelepterus*, but with entire margin to the præoperculum, no teeth on the vomer or tongue, and no band of villiform teeth behind the incisors. *H. azurea*, n. sp., *id. t. c.* p. 144, Gulf of California.

✓ *Xenocys*, n. g., closely allied to *Xenistius*, Jord. & Gilb., from which it differs in having the dorsal fins entirely separated; the spinous part of 9 spines, its base containing that of soft dorsal $1\frac{1}{2}$ times; nostrils smaller and closer together; teeth smaller; the fins more densely scaled, and the occipital crest lower. *X. jessiae*, n. sp., JORDAN & BOLLMAN, P. U. S. Nat. Mus. xii, p. 160, Galapagos Archipelago.

CIRRHITIDÆ.

Chilodactylus carponemus, C. & V., figured by MCCOY, Prodr. Zool. Vict. pls. clxxiii & clxxiv.

SCORPENIDÆ.

Sebastichthys levis, n. sp., p. 129, *S. chrysomelas purpureus*, n. var., p. 130, C. H. & R. S. EIGENMANN, West Am. Scientist, vi, Cortes Banks, California.

Scorpena cookii, Gthr., redescribed by DOUGLAS-OGILBY, P. Z. S. 1889, p. 155. *S. sonora*, n. sp., JENKINS & EVERMANN, P. U. S. Nat. Mus. xi, p. 150, Gulf of California. *S. russula*, n. sp., JORDAN & BOLLMAN, *op. cit.* xii, p. 165, Pacific coast of Colombia.

Gnathypops scopis, n. sp., JENKINS & EVERMANN, *op. cit.* xi, p. 152, Gulf of California.

Tetrarage guentheri, n. sp., BOULENGER, P. Z. S. 1889, p. 239, pl. xiv, Muscat, Arabia.

NANDIDÆ.

Plesiops, Cuv.: a revision of the species; VAILLANT, Bull. Soc. Philom. (8) i, pp. 57-60.

BERYCIDÆ.

Holocentrum coruscum, Poey, redescribed by JORDAN & BOLLMAN, P. U. S. Nat. Mus. xi, p. 550.

SCIENIDÆ.

JORDAN, D. S., & EIGENMANN, C. H. A Review of the *Sciænida* of America and Europe. Rep. U. S. Fish. Comm. for 1886, pp. 343-451, figs.

Umbrina striata, Blgr.: additional remarks by BOULENGER, P. Z. S. 1889, p. 245.

✓ *Corvula*, n. g., for *Johnius batabanus*, Poey, and allies; JORDAN & EIGENMANN, t. c. p. 377. *C. sialis*, n. sp., *iid. t. c.* p. 379, Florida Keys.

Stelliferus rastrifer, p. 393, and *naso*, p. 395, n. spp., *iid. ibid.*, coast of Brazil.

Menticirrhus sinus (= *M. nasus*, Jord. & Gilb., *nec* Gthr.), p. 427, Pacific Coast of Tropical America, and *agassizii*, p. 429, Coast of Chili, n. spp., *iid. ibid.*

Larimus pacificus, n. sp., JORDAN & BOLLMAN, P. U. S. Nat. Mus. xii, p. 161, Pacific Ocean, off coast of Colombia.

Polycirrhus rathbuni, n. sp., *iid. t. c.* p. 162, Panama.

TRICHIURIDÆ.

Thyrastes prometheus, C. & V.: embryonic specimens described and figured by GÜNTHER, Challenger Pelagic Fishes, p. 7, pl. i, figs. c & d. *T. lorissatoi*, n. sp. (foss.), BASSANI, Rend. Acc. Nap. (2) iii, p. 236, Miocene, Sardinia.

CARANGIDÆ.

Caranx jayakari, Blgr., noticed and figured by BOULENGER, P. Z. S. 1889, p. 245, pl. xxvi.

Seriola lalandii, C. & V., figured by MCCOY, Prodr. Zool. Vict. pl. clxxii.

Seriolichthys bipinnulatus, Q. & G.: young described and figured by GÜNTHER, Challenger Pelagic Fishes, p. 8, pl. i, figs. E & F; note by MEEK & BOLLMAN, P. Ac. Philad. 1889, p. 42.

Tamnodon saltator, L., figured by MCCOY, Prodr. Zool. Vict. pl. clxxxiii.

Lichia glauca, L. (?): young described and figured by GÜNTHER. *Op. cit.* p. 9, pl. i, fig. G. *L. vidago*, Risso: a specimen from the Isle of Skye noticed and figured by *id.*, P. Z. S. 1889, p. 50, pl. iv; also Ann. N. H. (6) iii, p. 107. *L. stoppanii*, p. 82, pl. ix, fig. 2, and *lata*, p. 84, pl. x, n. spp. (foss.), BASSANI, Atti Acc. Napoli (2) iii, Lower Miocene of Chiavon.

Amphistium dubium, n. sp. (foss.), *id. t. c.* p. 85, pl. xiii, fig. 1, Lower Miocene of Chiavon.

Lirus porosus, Rich.: young described and figured by GÜNTHER, Challenger Pelagic Fishes, p. 11, pl. ii, fig. F. *L. paucidens*, n. sp., *id. t. c.* fig. E, between New Guinea and Japan.

Platystethus huttonii, Gthr., described and figured by *id. t. c.* p. 13, pl. ii, figs. H & I. *P. guentheri*, n. sp. (?), DOUGLAS-OGILBY, P. Z. S. 1889, p. 157, Lord Howe's I.

STROMATEIDÆ.

Stromateus palometa, n. sp., JORDAN & BOLLMAN, P. U. S. Nat. Mus. xii, p. 156, Pacific Ocean, off coast of Colombia.

CORYPHÆNIDÆ.

Lampris luna, Gm. : on its occurrence on the Dutch Coast ; VAN LINTH DE JEUDE, Notes Leyd. Mus. xi, p. 85.

Mene oblonga, Zigno, n. var. *pusilla* (foss.), BASSANI, Atti Acc. Napoli (2) iii, p. 78, pl. xiv, fig. 5, Lower Miocene of Chiavon.

NOMEIDÆ.

Psenes arafurensis, n. sp., GÜNTHER, Challenger Pelagic Fishes, p. 13, pl. ii, fig. a, Arafura Sea.

Cubiceps gracilis, Lowe : young described and figured by *id. t. c.* p. 11, pl. ii, figs. A.-C.

SCOMBRIDÆ.

Thynnus, Cuv. *Orcynus*, Cooper, should be retained as the generic name of the Tunny ; GILL, P. U. S. Nat. Mus. xi, p. 319. R. STORMS, Bull. Soc. Belg. Géol. iii, pp. 163-178, reviews our knowledge of the osteology of the recent and fossil species of this genus. *T. thynnus*, L. : on its occurrence in the North Sea, GIARD, Bull. Sci. Nord. (3) ii, p. 178. *T. thunnina*, C. & V. : young described and figured by GÜNTHER, Challenger Shore-Fishes, p. 17, pl. ii, fig. d. *T. (Orcynus) scaldisii*, n. sp. (foss.), STORMS, *t. c.* p. 167, pl. vii, Pliocene, Antwerp.

Orcynus medius, n. sp. (foss.), BASSANI, Atti Acc. Napoli (2) iii, p. 74, pl. ix, fig. 1, Lower Miocene of Chiavon.

Lepidothynnus, n. g., showing distinct affinities to *Gastrochisma*. *L. huttonii*, n. sp., GÜNTHER, Challenger Pelagic Fishes, p. 15, pl. vi, fig. a, New Zealand.

Echeneis, L. : A. C. HADDON, Nature, xxxix, remarks on the employment of the Sucker-Fish in Turtle-fishing.

Opisthomyzon, n. g., for *Echeneis glaronensis*, Wettst. (foss.) ; COPE, Am. Nat. xxiii, p. 255.

TRACHINIDÆ.

P. H. KIRSCH & M. W. FORDICE publish a review of the European and American *Uranoscopidae* ; P. Ac. Philad. 1889, pp. 258-265.

Katheostoma averruncus, n. sp., JORDAN & BOLLMAN, P. U. S. Nat. Mus. xii, p. 163, Pacific Ocean, off coast of Colombia.

Sillago ciliata, C. & V., figured by MCCOY, Prodr. Zool. Vict. pl. clxxxii.

Opisthognathus ommatus, n. sp., JENKINS & EVERMANN, P. U. S. Nat. Mus. xi, p. 153, Gulf of California.

Notothenia antarctica, Pters., figured by STÜDER, Forschungsreise S.M.S. 'Gazelle,' iii, pl. xix, fig. 1.

ICOSTEIDÆ.

Bathymaster jordani, n. sp. (= *B. signatus*, J. & G., nec Cope) ; GILBERT P. U. S. Nat. Mus. xi, pp. 554, Puget's Sound and Alaska.

BATRACHIDÆ.

Porichthys margaritatus, Rich.: on the phosphorescent spots; C. H. & R. S. EIGENMANN, West Am. Scientist, vi, p. 32; F. C. TEST, Bull. Ess. Inst. xxi, pp. 43-52, pl. iv. *P. nautopodium*, n. sp., JORDAN & BOLLMAN, P. U. S. Nat. Mus. xii, p. 171, Pacific Ocean, off coast of Colombia.

PSYCHROLUTIDÆ.

T. GILL discusses the affinities of this family, which he is inclined to regard as a group of the *Cottidæ*; P. U. S. Nat. Mus. xi, pp. 321-327.

Neophrynichthys latus, Gthr., figured, pl. xli, *N. marmoratus*, n. sp., *id.* t. c. p. 327, coast of Patagonia.

PEDICULATI.

Lophius piscatorius, L.: on the ovaries; MOCQUARD, Bull. Soc. Philom. (8) i, p. 46.

Halieutæa coccinea, n. sp., ALCOCK, Ann. N. H. (6) iv, p. 382, Andaman Sea, 265 fath.

✓ *Brephostoma*, n. g. Soft tissues, except the dermal productions, rather delicate. Head large, quite unarmed. Body low, rather elongate, with large ctenoid scales. Mouth small, oblique, weak. Teeth entirely absent. Eyes large, lateral. Two dorsal fins, the spinous the less developed; anal similar to the soft dorsal; ventrals thoracic, with one spine and five rays. Gill-opening very wide; seven branchiostegals; pseudobranchiæ. No anal papilla. No air-bladder. Long pyloric cæca, in moderate number. *B. carpenteri*, n. sp., *id.* t. c. p. 383, Bay of Bengal, 1370-1520 fath.

COTTIDÆ.

Cottus scorpius, L.: on a monstrous specimen: E. NYSTRÖM, Bih. Sv. Ak. Handl. xiv, No. 10, pl.

Oligocottus analis, Gir.: note on the eggs; C. H. & R. S. EIGENMANN, West Am. Scientist, vi, p. 45.

Uranidea semiscabra centropleura, n. var., *id.* t. c. p. 149, Allen Springs, Lake Co., California.

Icelinus australis, n. sp., *id.* t. c. p. 131, Cortez Banks, California.

✓ *Paricelinus*, n. g., related to *Icelinus*. *P. hopliticus*, n. sp., *id.* *ibid.*, Cortez Banks.

Lepidocottus elongatus, n. sp. (foss.), BASSANI, Atti Acc. Napoli (2) iii, p. 50, pl. v, fig. 5, Lower Miocene of Chiavon.

Trigla arabica, Blg., noticed and figured by BOULENGER, P. Z. S. 1889, p. 245, pl. xxvii. *T. macrodactylus*, n. sp., GÜNTHER, Challenger Pelagic Fishes, p. 18, pl. iii, fig. A, off the coast of Sierra Leone.

Prionotus quiescens, p. 166, *albirostris*, p. 168, and *zenisma*, p. 169, n. spp., JORDAN & BOLLMAN, P. U. S. Nat. Mus. xii, Pacific Ocean, off coast of Colombia.

DISCOBOLI.

GUITEL, F. Sur les Canaux muqueux des Cycloptéridés. CR. cir, pp. 648-651.

*BORCKERT, H. Anatomisch-physiologische Untersuchung der Haftscheibe von *Cyclopterus lumpus*. Inaug. Diss. Kiel: 1889, 8vo, 36 pp., 2 pls.

GOBIIDÆ.

Gobius townsendi, n. sp., C. H. & R. S. EIGENMANN, P. U. S. Nat. Mus. xi, p. 463, San Diego Bay, California [= *G. mirabilis*, juv., EIGENMANN, in litt.]. *G. chiquita* and *longicaudus*, n. spp., JENKINS & EVERMANN, t. c. p. 146, Gulf of California.

Lepidogobius gilberti, n. sp., C. H. & R. S. EIGENMANN, t. c. p. 464, San Diego Bay, California.

✓ *Bollmannia*, n. g., differing from *Lepidogobius* by having no fleshy processes on inner edge of shoulder girdle, the interorbital area narrower and without median keel, and by the very large ctenoid scales. *B. chlamydes*, n. sp., JORDAN, op. cit. xii, p. 164, Pacific Ocean, off coast of Colombia.

Gillichthys y-cauda, p. 147, and *guaymasiæ*, p. 148, n. spp., JENKINS & EVERMANN, op. cit. xi, Gulf of California.

Typhlogobius californiensis, Stdr.: notes by C. H. & R. S. EIGENMANN, West Am. Scientist, vi, p. 46.

A. C. HADDON, Nature, xxxix, p. 285, has made experiments on the caudal respiration of *Periophthalmus kalbreyteri*, first observed by S. J. HICKSON. The fish is figured by the latter author in his "Naturalist in North Celebes" (London, 1889), frontispiece.

Eleotris maltzani, n. sp., HILGENDORF, SB. Nat. Fr. 1889, p. 53, Hayti

HETEROLEPIDOTIDÆ.

Zaniolepis frenatus, n. sp., C. H. & R. S. EIGENMANN, West Am. Scientist, vi, p. 147, Cortez Banks, California.

BLENNIIDÆ.

Runula, n. g., allied to *Pteroscirtes*, Rüpp., but with the small, inferior mouth destitute of canines; body slender; dorsal fin continuous, its spines and soft rays indistinguishable; gill-openings reduced; scales none. *R. azalea*, n. sp., JORDAN & BOLLMAN, P. U. S. Nat. Mus. xii, p. 171, Galapagos Archipelago.

56 *Clinus*, C. & V.: a revision of the specimens in the Paris Museum; F. MOCQUARD, Bull. Soc. Philom. (8) i, pp. 40-46. *C. ocellifer*, n. sp., id. t. c. p. 44, coast of California.

✓ *Pseudoblennius*, n. g., apparently related to *Pholidichthys*, Blkr. *P. hypacanthus*, n. sp., JENKINS & EVERMANN, P. U. S. Nat. Mus. xi, p. 156, Gulf of California.

Isesthes gilberti, Jord. : note on the eggs ; C. H. & R. S. EIGENMANN, West Am. Scientist, vi, p. 44.

SPHYRÆNIDÆ.

Sphyræna intermedia, n. sp. (foss.), BASSANI, Atti Acc. Napoli (2) iii, p. 97, pl. xiv, fig. 4, Lower Miocene of Chiavon.

ATHERINIDÆ.

Atherina sardina, n. sp., JENKINS & EVERMANN, P. U. S. Nat. Mus. xi, p. 137, Gulf of California.

Atherinops regis, n. sp., *iid.* t. c. p. 138, Gulf of California.

Menidia gilberti, n. sp., JORDAN & BOLLMAN, *op. cit.* xii, p. 155, Panama.

GASTROSTEIDÆ.

Gastrosteus tymensis, n. sp., NIKOLSKY, Faun. Saghal. Isl., p. 293, Saghalien I.

GOBIESOCIDÆ.

Gobiesox hæres, n. sp., JORDAN & BOLLMAN, P. U. S. Nat. Mus. xi, p. 552, Bahamas.

LOPHOTIDÆ.

Lophotes cepedianus, Giorna : young described and figured by GÜNTHER, Challenger Pelagic Fishes, p. 19, pl. ii, fig. k.

TRACHYPTERIDÆ.

On the caudal fin of *Trachypterus* and *Begalecus* ; F. A. SMITT, Biol. fören. i, pp. 17-21, figs.

NOTACANTHIDÆ.

Notacanthus rostratus, n. sp., COLLETT, Bull. Soc. Z. Fr. xiv, p. 307, off Newfoundland.

ACANTHOPTERYGII PHARYNGOGNATHI.

LABRIDÆ.

Crenilabrus aurantiacus, Facciolá : further notes by FACCIOLÁ, Nat. Sicil. viii, p. 208.

Labrichthys laticlavus, Rich., figured by MCCOY, Prodr. Zool. Vict. pl. clxiii.

Heteroscarus macleayi, n. sp., *id.* *op. cit.* pl. clxiv, Portland, Victoria.

Sparisoma niphobius, n. sp., JORDAN & BOLLMAN, P. U. S. Nat. Mus. xi, p. 551, Bahamas.

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Pseudojulis venustus, n. sp., JENKINS & EVERMANN, P. U. S. Nat. Mus. xi, p. 145, Gulf of California.

Chacrops ommopterus, Rich.: notes by DOUGLAS-OGILEY, P. Z. S. 1889, p. 158.

EMBIOTOCIDÆ.

Micrometrus aggregatus, Gibb: note on the eggs; C. H. & R. S. EIGENMANN, West Am. Scientist, vi, p. 45.

Ditrema orthonotus, n. sp., *id. t. c.* p. 127, Cortez Banks, California.

CHROMIDES.

✓ *Oreochromis*, n. g., closely allied to *Chromis* and *Hemichromis*, but distinguished by the presence of four anal spines. *O. hunteri*, n. sp., GÜNTHER, P. Z. S. 1889, p. 70, Crater Lake of Kilima-njaro.

Heros beani, n. sp., JORDAN, P. U. S. Nat. Mus. xi, p. 332, Mazatlan.

ANACANTHINI.

GADIDÆ.

Onus reinhardtii, Collett: young described and figured by GÜNTHER, Challenger Pelagic Fishes, p. 20, pl. iii, fig. f.

Raniceps trifurcus, Walb. (?): young described and figured by *id. t. c.* p. 21, pl. iii, fig. e.

Bregmaceros, Thomps., recharacterized; *id. t. c.* p. 24. *B. maclellandii*, Thomps., described and figured; *id. t. c.* p. 25, pl. iii, figs. a & n. *B. bathymaster*, n. sp., JORDAN & BOLLMAN, P. U. S. Nat. Mus. xii, p. 173, Pacific coast of S. America.

✓ *Auchenoceros*, n. n. for *Calloptilum*, Hutton, *nee* Rich.; GÜNTHER, *t. c.* p. 24. *A. punctatum*, Hutt., described and figured, p. 25, pl. iii, fig. c.

✓ *Eretmophorus*, n. g. Body moderately elongate, covered with small cycloid scales marked with concentric lines, and not extending to the head and abdomen, which are naked. Abdomen prolonged into a great cone, with the anal aperture at its extremity. A separate caudal, two dorsals and one anal fin; the second dorsal and anal largely and equally developed. Pectorals lobate; ventrals jugular, with five rays, three of which, and especially the third and fourth, are greatly elongated and furnished at the end with a lanceolate paddle-like blade. Vertex of head and nape with small hyaline cylindrical warts. Teeth very small, few, and inconspicuous, on premaxillæ and end of mandible. Branchiostegals, seven. No barbel. *E. kleinenbergi*, n. sp., GIGLIOLI, P. Z. S. 1889, p. 328, pl. xxxiv, Messina.

OPHIDIIDÆ.

Sirembo nigripinnis, n. sp., ALCOCK, Ann. N. H. (6) iv, p. 384, Andaman Sea, 490 fath.

- ✓ *Pycnocrasedum*, n. g., allied to *Barathrodemus*. *P. squamipinne*, n. sp., *id. t. c.* p. 386, Bay of Bengal, 193 fath.
- ✓ *Paradicrolene*, n. g., allied to *Dicrolene* and *Pteroidonus*. *P. multiflin*, n. sp., *id. t. c.* p. 387, Bay of Bengal, 193 fath.
- ✓ *Succogaster*, n. g., allied to *Catolax*. *S. maculatus*, n. sp., *id. t. c.* p. 389, Bay of Bengal, 193 fath.
- ✓ *Glyptophidium*, n. g., allied to *Bathyonus*. *G. argenteum*, n. sp., *id. t. c.* p. 390, Andaman Sea, 271 fath.
- Otophidium indefatigabile*, n. sp., JORDAN & BOLLMAN, P. U. S. Nat. Mus. xii, p. 172, Galapagos Is.
- Fierasfer acus*, Brunn.: young described and figured by GÜNTHER, Challenger Pelagic Fishes, p. 27, pl. iv, fig. F.

MACRURIDÆ.

Macrurus investigatoris, p. 391, Andaman Sea, 265–490 fath., *semiquincunciatus*, p. 392, Bay of Bengal, 130–250 fath., *brevirostris*, p. 393, Andaman Sea, 490 fath., *macrolophus*, p. 394, Andaman Sea, 265 fath., *lophotes*, p. 395, Bay of Bengal, 285–405 fath., *polylepis*, p. 395, Bay of Bengal, 272 fath., *heterolepis*, p. 396, Andaman Sea, 271 fath., and *hispidus*, p. 397, Bay of Bengal, 220–240 fath., n. spp., ALCOCK, Ann. N. H. (6) iv.

PLEURONECTIDÆ.

JORDAN, D. S., & GOSS, D. K. A Review of the Flounders and Solos (*Pleuronectidæ*) of America and Europe. Rep. U. S. Fish. Comm. for 1886, pp. 225–342, figs.

GILL, T. Gleanings among the *Pleuronectidæ*, with observations on the name *Pleuronectidæ*. P. U. S. Nat. Mus. xi, pp. 593–606.

Notes on some larval Pleuronectoids; GÜNTHER, Challenger Pelagic Fishes, pp. 28 & 29.

Rhombus boscii, Risso: notes; *id.* Ann. N. H. (6) iv, p. 418.

Hippoglossina macrops, Stdr.: young specimens described by JORDAN & BOLLMAN, P. U. S. Nat. Mus. xii, p. 175.

✓ *Azevia*, n. g., for *Citharichthys panamensis*, Stdr.; JORDAN & GOSS, Rep. U. S. Fish. Comm. for 1886, p. 271. *A. querna*, n. sp., JORDAN & BOLLMAN, P. U. S. Nat. Mus. xii, p. 174, Pacific Ocean, off coast of Colombia.

✓ *Citharichthys uhleri*, p. 275, W. Indies, and *sumichrasti*, p. 276, Pacific coast of Tropical America; JORDAN & GOSS, *t. c.* *O. gilberti*, n. sp., JENKINS & EVERMANN, P. U. S. Nat. Mus. xi, p. 157, Gulf of California.

Etropus ectenes, n. sp., JORDAN & GOSS, *t. c.* p. 277, Pacific coast of S. America.

Solea greenii, n. sp., GÜNTHER, Ann. N. H. (6) iv, pp. 249 & 419, off the W. coast of Ireland, 150 fath.

Achirus garmani, n. sp., JORDAN & GOSS, *t. c.* p. 314, Rio Grande do Sul.

Achiropsis asphyziatus, n. sp., *id. t. c.* p. 318, Goyaz, Brazil.

Platophrys constellatus, n. sp., *id. t. c.* p. 266, Galapagos Archipelago.

✓ *Engyophrys*, n. g., allied to *Platophrys*, Swains., but having the inter-

orbital space very narrow and armed with a spine, and the scales of moderate size and cycloid; gill-rakers obsolete; no anal spine; gill-membranes entirely separate. *E. sancti-laurentii*, n. sp., JORDAN & BOLLMAN, P. U. S. Nat. Mus. xii, p. 176, Pacific Ocean, off coast of Colombia.

Symphurus atramentatus, p. 177, and *leei*, p. 178, n. spp., *iid. t. c.*, Pacific Ocean, off coast of Colombia.

✓ *Cyclosetta*, n. g., type *C. fimbriata*, and *Trichopsetta*, n. g., type *T. ventralis*, Goode & Bean; GILL, *op. cit.* xi, p. 601.

PHYSOSTOMI.

SILURIDÆ.

EIGENMANN, C. H. & R. S. Preliminary Notes on South American *Nematognathi*, II. P. Cal. Ac. Sci. (2) ii, pp. 28-56.

BRIDGE, T. W. The Air-bladder in certain Siluroid Fishes. P. Birmingham Phil. Soc. vi, pp. 131-136.

BRIDGE, T. W., & HADDON, A. C. Contributions to the Anatomy of Fishes. I. The Air-bladder and Weberian Ossicles in the *Siluridæ*. P. R. Soc. xlii, pp. 309-328.

Noturus furiosus, p. 351, pl. xliii, fig. 1, and *gilberti*, p. 352, fig. 2, n. spp., JORDAN, P. U. S. Nat. Mus. xi, United States.

Pimelodus (Pseudorhamdia) nigribarbis, n. sp., BOULENGER, Ann. N. H. (6) iv, p. 266, Camapuam R., Brazil.

Acentronichthys, n. g., allied to *Heptapterus*, for *A. leptos*, n. sp., C. H. & R. S. EIGENMANN, *t. c.* p. 29, Sao Matheos, Brazil.

Nemuroglanis, n. g. (*Pimelodinae*), for *N. lanceolatus*, n. spp., *iid. ibid.*, Jutahy, Brazil.

Steindachneria doceana, n. sp., *iid. t. c.* p. 30, Rio Doce, Brazil.

Pseudoplatystoma fasciatum nigricans and *brevifile*, n. varr.; *iid. t. c.* p. 31, Brazil.

Arius, C. & V.: on Eocene remains; E. T. NEWTON, P. Z. S. 1889, pp. 201-207, pl. xxi. *A. baroni*, n. n. for an otolith from Madagascar; *id. t. c.* p. 206. *A. egertoni*, Sow. (foss.): note by G. SMETS, Ann. Soc. Brux. xii (1888), p. 190. Criticism of Smets's note; DOLLO, Bull. Soc. Belg. Géol. iii, p. 218.

Tuchysurus upsulonophorus, n. sp., C. H. & R. S. EIGENMANN, *t. c.* p. 31, Rio Grande do Sul.

Aelurichthys filamentosus, Sw.: notes by JORDAN, P. U. S. Nat. Mus. xi, p. 411.

Auchenopterus asper, n. sp., JENKINS & EVERMANN, *t. c.* p. 154, Gulf of California.

Synodontis nebulosus, Peters: notes by PFEFFER, JB. Hamb. vi, 2, p. 13. *S. eurystomus*, n. sp., *id. t. c.* p. 14, Rufu, E. Africa. *S. punctulatus*, n. sp. GÜNTHER, P. Z. S. 1889, p. 71, pl. viii, fig. A, River Ruva, Arusha country, E. Africa.

✓ *Anoplopterus*, n. g., of the group *Protopteri*, but without nasal barbel;

- PFEFFER, JB. Hamb. vi, 2, p. 15. *A. uranoscopus*, n. sp., *id. t. c.* p. 16, Ushonda and Mhonda, E. Africa.
- ✓ *Furlowella*, n. n. for *Acestra*, Kner, *nec* Dall; C. H. & R. S. EIGENMANN, *t. c.* p. 32. *F. carinata*, n. sp., *iid. ibid.*, Brazil.
- Loricaria panamensis*, p. 34, Panama, *brevirostris*, p. 35, Iça, Brazil, *lata*, p. 36, Goyaz, Brazil, and *phoxocephala*, p. 37, Corry, Brazil, n. spp., *iid. t. c.*
- ✓ *Oxyropsis*, n. g., near *Hurtia*, Stdr., for *O. wrightiana*, n. sp., *iid. t. c.* p. 39, and Hyanuary, Brazil.
- ✓ *Hisonotus*, n. g. (*Loricariinae*), p. 40, for *H. notatus*, n. sp., *id. t. c.* p. 41, Brazil.
- ✓ *Parotocinclus*, n. subg. of *Hisonotus*, for *H. maculicauda*, Stdr.; *iid. t. c.* p. 41.
- ✓ *Microlepidogaster*, n. g., closely allied to *Otocinclus*, but differing in the armature of the belly, and in the position of the dorsal fin. *M. perforatus*, n. sp., C. H. & R. S. EIGENMANN, West Am. Scientist, vi, p. 8, Brazil.
- Rhinelepis lophophanes*, n. sp., *iid. t. c.* p. 9, Brazil.
- ✓ *Panaque*, n. g., type *Chaetostomus lineatus*, Ptrs.; *iid. P. Cal. Ac.* (2) ii, p. 44.
- ✓ *Delturus*, n. g., for *D. angulicauda*, Stdr., and *D. parahybæ*, n. sp., *iid. t. c.* p. 45, Brazil.
- Ancistrus chagresi*, n. sp., *iid. t. c.* p. 47, Chagres R.
- Bunocephalus scabriceps*, n. sp., *iid. t. c.* p. 49, Brazil.
- Pygidium oroyæ*, p. 51, and *immaculatum*, p. 52, n. spp., *iid. t. c.*, Brazil.
- ✓ *Tridens*, n. g., allied to *Pygidium*; *iid. t. c.* p. 53. *T. melanops*, p. 53, and *brevis*, p. 54, n. spp., Brazil.
- ✓ *Pseudostegophilus*, n. g., for *Stegophilus nemurus*, Gthr.; *iid. t. c.* p. 54.
- ✓ *Miuroglanis*, n. g., near *Pareiodon*, Kner; *iid. t. c.* p. 55. *M. platycephalus*, n. sp., p. 56, Jutahy, Brazil.
- ✓ *Lepidoglanis*, n. g.: resembling *Chimarrichthys*, Sauv., in shape, but covered with cycloid scales, like a Cyprinoid. *L. monticola*, n. sp., VAILLANT, CB. Congrès intern. Zool. Paris, 1889, p. 82, Kina Balu, Borneo.
- Bucklandium diluvii*, König (foss.): notes by A. S. WOODWARD, P. Z.S. 1889, p. 208, pl. xxii.

SCOPELIDÆ.

- Synodus evermanni*, p. 152, and *jenkinsi*, p. 153, n. spp., JORDAN & BOLLMAN, P. U. S. Nat. Mus. xii, Pacific Ocean, off coast of Colombia.
- Bathypterois guentheri*, n. sp., ALCOCK, Ann. N. H. (6) iv, p. 450, Andaman Sea, 490 fath.
- Scopelus*, Cuv.: notes on the Mediterranean species; RAFFAELE, MT. z. Stat. Neap. ix, pp. 179-185, pl. vii. *S. scoticus*, n. sp., GÜNTHER, Challenger Pelagic Fishes, p. 31, Farøe Channel.
- Myctophum californiense*, p. 124, and *townsendi*, p. 125, n. spp., C. H. & R. S. EIGENMANN, West Am. Scientist, vi, Cortez Banks, California.
- Notoscopelus? brachyichir*, n. sp., *iid. t. c.* p. 126, Cortez Banks, California.

Scopeloides nicolisi, n. sp. (foss.), BASSANI, Atti Acc. Napoli (2) iii, p. 32, pl. i, fig. 5, Lower Miocene of Chiavon.

Sudis jayakari, n. sp., BOULENGER, P. Z. S. 1889, p. 241, fig., Muscat, Arabia.

Prymnothonus, Rich.: notes on this larval form, and figures of four specimens; GÜNTHER, Challenger Pelagic Fishes, p. 39, pl. v.

CYPRINIDÆ.

Catostomus gila, n. sp., KIRSCH, P. U. S. Nat. Mus. xi, p. 555, Arizona.
✓ *Xyrauchen*, n. g. for *Catostomus cypho*, Lock., which is described; *id. t. c.* p. 556.

Sclerognathus chinensis, n. sp., GÜNTHER, Ann. N. H. (6) iv, p. 223, Kiu Kiang, China.

Moxostoma rupiscartes, n. sp., JORDAN, P. U. S. Nat. Mus. xi, p. 353, pl. xlv, fig. 3, North Carolina.

Cirrhina afghana, n. sp., GÜNTHER, Tr. L. S. (2) v, p. 106, pl. xii, fig. c, N. Baluchistan and N.W. Afghanistan.

Tylognathus montanus, n. sp., GÜNTHER, P. Z. S. 1889, p. 71, pl. viii, fig. b, River Ruva, Arusha Country, E. Africa.

Barbus semibarbus, n. n. for *Hemibarbus maculatus*, Blkr.; *id. Ann. N. H.* (6) iv, p. 224. *B. dissimilis*, Blkr., = *B. labeo*, Pall.; *id. ibid.* *B. jacksoni*, n. sp., *id.*, P. Z. S. 1889, p. 72, River Ruva, Arusha Country, E. Africa. *B. macrolepis*, p. 17, *oxyrhynchus*, p. 18, *nigrolinea*, p. 19, and *laticeps*, p. 20, n. spp., PFEFFER, JB. Hamb. vi, 2, E. Africa.

✓ *Matsya*, n. n. for *Acanthonotus*, Day, *nec* Bl. Schn.; DAY, Faun. Ind., Fishes, i, p. 292.

Schizothorax intermedius, MClell., p. 106, pls. ix, fig. 2, x, fig. & xiv, fig. 1, *poelzami*, Kessl., p. 118, pl. xviii, fig. 1, *irregularis*, Day, p. 124, pl. xiv, fig. 1, *argenteus*, Kessl., p. 137, pls. x, fig. 2, & xiii, fig. 1, *orientalis*, Kessl., p. 148, *biddulphi*, Gthr., p. 150, pls. xi, figs. 1 & 2, & xii, fig. 2, and *eurystomus*, Kessl., p. 166, pl. xix, fig. 1, described by HERZENSTEIN, Przewalski Reise, Fische. *S. intermedius*, MClell.: notes by GÜNTHER, Tr. L. S. (2) v, p. 107. *S. raulinsii*, n. sp., *id. t. c.* p. 108, pl. xii, figs. A & n, Hari Rud R., Afghanistan [identified by HERZENSTEIN, *t. c.* p. 118, with *S. poelzami*, Kessl.]. *S. regelii*, p. 130, pl. ix, fig. 1, Upper Amu Daria, *potanini*, p. 134, pl. xvi, fig. 1, Lun-ang-Fu, *altior*, p. 158, pl. xii, fig. 1, Lob-Nor, *dayi*, p. 161, pl. xiii, fig. 2, Lob-Nor, *kessleri*, p. 173, pl. xix, fig. 2, *sinensis*, p. 175, pl. xx, fig. 2, Lun-ang-Fu, and *dolichonema*, p. 178, pl. xx, fig. 1, Dy-Tschu, n. spp., HERZENSTEIN, *t. c.*

Diptychus lansdelli, n. sp., GÜNTHER, Ann. N. H. (6) iii, p. 362, Issik Kul.

Pseudogobio styani, n. sp., *id. op. cit.* iv, p. 224, Kiu Kiang.

Rhinogobio typus, Blkr., = *R. cylindricus*, Gthr.; *id. t. c.* p. 224.

Xenocypris davidi, Blkr., = *X. argentea*, Gthr.; *id. t. c.* p. 225.

✓ *Rhynchocypris*, n. g. Scales small, lateral line present; dorsal fin short, without spine, its origin being immediately behind the root of the ventrals; anal fin short; mouth lateral, but overlapped by the conically protruding snout; intermaxillaries slightly protractile, free from the

upper part of the snout in their entire circumference ; the labial fold of the lower jaw is lateral only, and does not extend across the symphysis ; barbel, none ; gill-rakers very short and few in number ; pseudobranchiæ glandular ; pharyngeal teeth uncinatæ, in two rows, 5, 2 ; intestine short, with one convolution ; peritoneum black. *R. variegata*, n. sp., *id. t. c.* p. 225, Kiu Kiang, China.

On a hybrid between *Leuciscus rutilus* and *Alburnus alburnus* ; *id.* P. Z. S. 1889, p. 50.

Leuciscus suchalinensis, n. sp., NIKOLSKY, Faun. Saghal. Isl. p. 296, Saghalien I.

Squalius danilewskii, Kessl., figured by RUSSKI, Protok. obsch. estest Kazan, 1888-89, No. 105, pl. -.

Notropis heterodon, Cope : notes by GILBERT, P. U. S. Nat. Mus. xi, p. 609. *N. volucella*, Cope : note by MEEK ; *t. c.* p. 437. *N. macdonaldi* and *kanawha*, n. spp., JORDAN, *t. c.* p. 354, pl. xlv, figs. 4 & 5, Virginia.

Opsopæodus emiliae, Hay, redescribed by MEEK, *t. c.* p. 438.

Phoxinus (Tigoma) clevelandi, n. sp., C. H. & R. S. EIGENMANN, West Am. Scientist, vi, p. 149, Ætna Springs, Napa Co., California.

Hybopsis watanga, n. sp., JORDAN, P. U. S. Nat. Mus. xi, p. 355, pl. xlv, fig. 6, United States.

✓ *Scombrocypris*, n. g., allied to *Opsariichthys*, but with very powerful jaws, the mandible with a pointed hook-like projection in front, fitting into a hollow of the upper jaw. *S. styani*, n. sp., GÜNTHER, Ann. N. H. (6) iv, p. 226, Kiu Kiang, China.

✓ *Parupelecus*, n. g. Body similar to that of a herring, much compressed, the entire edge being trenchant. Scales of moderate size ; lateral line abruptly bent down above the pectoral fin. Cleft of the mouth oblique ; barbels, none. Dorsal fin short, without spine, placed opposite to the space between ventral and anal ; anal fin long, many-rayed ; caudal fin forked ; pectorals rather long ; ventrals well developed. Gill-covers attached by a membrane to the isthmus. Pharyngeal teeth in a triple series, hooked, 5, 4, 2. *P. argenteus*, n. sp., *id. t. c.* p. 227, Kiu Kiang, China.

Nemachilus kessleri, n. sp., *id.*, Tr. L. S. (2) v, p. 109, Nushki, Helmand.

Lefua costata, Kessl., p. 93, and *Pleskei*, Herz., p. 95, described by HEZENSTEIN, Przewalski Reise, Fische.

Cobitis, L. *Nemachilus xanthi*, Gthr., is a *Cobitis* ; GÜNTHER, Ann. N. H. (6) iv, p. 228.

Botia variegata, n. sp., *id. t. c.* p. 228, Ichang, China.

CHARACINIDÆ.

EIGENMANN, C. H. & R. S. A Review of the *Erythrininae*. Proc. Cal. Ac. Sci. (2) ii, pp. 100-116, pl. i.

Pyrhulina mazima, n. sp., *id. t. c.* p. 111, pl. i, fig. 4, Tabatinga, Upper Amazon.

✓ *Omiodon*, n. g. (*Erythrinina*). Maxillary toothless ; præmaxillary and dentary with minute, conical, equal teeth ; caudalis notched. *O. cabassii*, 1889. [VOL. XXVI.]

n. sp. (foss.), BASSINI, Atti Acc. Napoli (2) iii, No. 4, p. 2, pl. i, Middle Eocene, Friuli, Prov. Udine.

EIGENMANN, C. H. & R. S. A Revision of the Edentulous Genera of *Curimatine*. Ann. N. York Ac. iv, pp. 409-440.

✓ *Pnetrogaster*, n. g. (*Curimatine*) Postventral region trenchant, the scales of each side with a narrow margin bent over the ventral ridge, and terminating medially in a spiniform process; preventral region rounded: predorsal region scaled; scales, 50-60. *P. rhomboides* and *amazonica*, n. spp., *ibid.*, West Am. Scientist, vi, p. 7, and Ann. N. York Ac. iv, pp. 412 & 413, Brazil.

Curimatopsis microlepis, n. sp., *ibid. ibid.*, Brazil.

Curimatus serpens, pp. 7 & 418, *lepidurus*, pp. 8 & 417, *spilurus*, p. 419, *spiluropsis*, p. 420, *dorsalis*, p. 420, *guentheri*, p. 423, *microcephalus*, p. 423, *plumbeus*, p. 425, *leucostictus*, p. 425, *ocellatus*, p. 427, *isognathus*, p. 428, *macrops*, p. 429, *falcatus*, p. 430, *simulatus*, p. 430, n. spp. *ibid. ibid.*, Brazil. *C. alburnus lineatus*, p. 419, *elegans bahiensis*, p. 421, *bimaculatus sialis*, p. 422, *gilberti brevipinnis*, p. 424, n. vars., *ibid. ibid.*, Brazil.

CYPRINODONTIDÆ.

Cyprinodon nevadensis, n. sp., C. H. & R. S. EIGENMANN, Proc. Cal. Ac. Sci. (2) i, p. 270, Inyo County, California.

Fundulus rathbuni, n. sp., JORDAN, P. U. S. Nat. Mus. xi, p. 356 pl. xlv, fig. 7, N. Carolina.

✓ *Pœcilia* (*Acropœcilia*, n. subg.) *tridens*, n. sp.; HILGENDORF, SB. Nat. Fr. 1889, p. 52. Hayti. *P. butleri*, n. sp., JORDAN, P. U. S. Nat. Mus. xi, p. 330, Presidio, Mexico.

Girardinus iheringii, n. sp., BOULENGER, Ann. N. H. (6) iv, p. 266, Rio Grande do Sul, Brazil.

HETEROPYGII.

Typhlichthys subterraneus, Gir.: notes on the habits; GARMAN, Bull. Mus. C. Z. xvii, p. 232.

Chologaster aritus, n. sp., JORDAN, P. U. S. Nat. Mus. xi, p. 356 pl. xlv, fig. 8, Virginia.

SCOMBRESOCIDÆ.

Exocoetis solandri, C. & V., p. 35, pl. iv, fig. A, and *simus*, C. & V., p. 37, described by GÜNTHER, Challenger Shore-Fishes. *E. aeneus*, n. sp., *ibid. t. c.* p. 36, pl. 1, fig. A, between the Fiji and New Hebrides Is.

C. MOHRUS writes on the movements of the Flying Fish through the air: Arch. Anat. Phys. 1889, Phys. p. 348.

STRATODONTIDÆ.

Euchodus shumardi, Leidy (foss.): notes by WHITEAVES, Contr. Can. Pal. i, p. 194, pl. xxvi, fig. 7.

STERNOPTYCHIDÆ.

Diplophos tenia, Gthr., described and figured by GÜNTHER, Challenger Shore-Fishes, p. 32, pl. iv, fig. c. *D. pacificus*, n. sp., *id. t. c.* p. 33, pl. iv, fig. b, Mid Pacific.

STOMIATIDÆ.

Stomias nebulosus, n. sp., ALCOCK, Ann. N. H. (6) iv, p. 451, Gulf of Manaar, 597 fath.

✓ *Photostomias*, n. g., near *Photoneustes* and *Malacosteus*. *P. guerni*[i], n. sp., COLLETT, Bull. Soc. Z. Fr. p. 291, off the Açores, depth 1138 metres.

SALMONIDÆ.

•TRAHERNE, J. P. The Habits of the Salmon. London: 1889, 8vo.

KÜNSTLER, J. Recherches sur la Reproduction du Saumon de la Dordogne. CR. Congrès intern. Zool. Paris, 1889, pp. 83-96.

Salmo trutta, L.: on the habits and parasites observed at Wimereux ; A. GIARD, C.R. cix, p. 236.

✓ *Coregonus pusillus*, n. sp., BEAN, P. U. S. Nat. Mus. xi, p. 526, Alaska.

✓ *Halophya*, n. g., for young specimens showing some affinities to *Microstoma* ; GÜNTHER, Challenger Shore-Fishes, p. 38. *H. elongata*, n. sp., *id. t. c.* p. 39, pl. vi, fig. c, between Sydney and Wellington.

CLUPEIDÆ.

HOLT, E. W. L. Notes on the Early Life-history of the Herring. Ann. N. H. (6) iv, pp. 368-372, figs.

F. A. SMITT, Bih. Sv. Ak. Handl. xiv, No. 12, writes on the decrease of the Herring on the coast of Sweden.

G. POUCHET & E. BIÉTRIX write on the development of *Clupea alosa* and *C. finta* ; C.R. cix, pp. 951-953, and J. Anat. Phys. xxv, pp. 628-639.

POUCHET, G. Le régime de la Sardine en 1888 sur la côte bretonne. C.R. cix, pp. 34 & 35.

——. Sur l'œuf de la Sardine. T. c. pp. 119 & 120.

——. Sur la croissance de la Sardine océanique. T. c. p. 199.

MARION, A. F. Observations sur la Sardine de la Méditerranée. T. c. pp. 290-292.

Clupea vectensis, n. sp. (foss.), E. T. NEWTON, Q. J. Geol. Soc. xlv, p. 113, figs., pl. iv, Oligocene, Isle of Wight. *C. ombonii*, p. 40, pl. iii, fig. 1, and *grandonii*, p. 41, pl. iii, fig. 4, n. spp. (foss.), BASSANI, Atti Acc. Napoli (2) iii, Lower Miocene of Chiavon.

Stolephorus, Laüp.: note on the eggs ; C. H. & R. S. EIGENMANN, West Am. Scientist, vi, p. 45.

HALOSAURIDÆ.

Halosaurus anguilliformis, n. sp., ALCOCK, Ann. N. H. (6) iv, p. 453, Gulf of Manaar, 675 fath.

- ✓ *Halosaurichthys*, n. g., differing from *Halosaurus* in possessing a long rudimentary second dorsal fin, and in having the ventrals united into a broad flat plate. *H. carinicauda*, n. sp., id. t. c. p. 454, Andaman Sea, 490 faths.

MURÆNIDÆ.

E. BLANCHARD, C.R. cix, p. 169, suggests experiments on the mode of life of the Eel on the French coasts.

VAILLANT, L. Observations relatives à la montée de l'Anguille sur les côtes de France. T. c. pp. 31-33.

JOURDAIN, S. Sur l'Anguille. T. c. pp. 200-202.

MOSSO, U. Recherches sur la nature du venin qui se trouve dans le sang de l'Anguille. Arch. Ital. Biol. xii, pp. 229-236.

Congromuræna longicauda, n. sp., ALCOCK, Ann. N. H. (6) iv, p. 455, Andaman Sea, 265 fath.

- ✓ *Cologonger*, n. g., allied to *Conger*. *C. raniceps*, n. sp., id. t. c. p. 456.
✓ Andaman Sea, 265-271 fath.

✓ *Stilbiscus*, n. g., near *neoconger*, Gir. *S. edwardsi*, n. sp., JORDAN & BOLLMAN, P. U. S. Nat. Mus. xi, p. 549, Bahamas.

- ✓ *Conchognathus*, n. g., a Murænoid with well developed fins, scaly skin, very narrow branchial clefts, and the lower jaw very broad and swollen, conchiform; COLLETT, Bull. Soc. Z. Fr. xiv, p. 123. *O. grimakii*, n. sp., id. t. c. p. 124, off the Azores.

Sauromurænesax, n. g. Form of the body widely departing from the typical, the trunk being high and well marked off from the head and tail which is a long tapering appendage. Tissues well developed. Gills four, opening into the pharynx by wide slits; gill-openings separate. Heart situated immediately behind the gills. Nostrils lateral. Eye large. Tongue free. Vertical fins ill developed, confluent; the dorsal begins in front of the level of the gill-opening. Pectoral fins well developed. No scales. Snout long, pointed. Cleft of mouth extending far behind the eye; the upper jaw overlapping the lower. One complete row of teeth in each jaw, and a second incomplete row in the maxilla: præmaxillary teeth and those at the mandibular symphysis fang-like; a single row of large fangs in the vomer. *S. vorax*, n. sp., ALCOCK, t. c. pp. 457 & 458, Bay of Bengal, 193 fath.

Dysommia, n. g. Soft tissues well developed; osseous tissues weak. Body high anteriorly and the head much inflated. Tail tapering to a point. Vent situated immediately behind the gill-opening. Snout short, slightly overhanging the mouth, its surface with many pores. Eye minute, concealed beneath the skin. Nostrils large, lateral. Cleft of mouth wide. Minute sharp teeth in a single row in each jaw; a row of

larger teeth on the vomer. Tongue not free. Four gills, communicating with the pharynx by wide slits. Osseous elements of the gill-cover rudimentary or absent. Gill-openings separate. Head situated between the gills. No scales. Vertical fins fairly developed, the dorsal beginning just behind the occiput. Pectorals well developed. *D. bucephalus*, n. sp., *id. t. c.* p. 459, Bay of Bengal, 193 fath.

✓ *Gurualiceps*, n. g., differing from *Nemichthys* in having the eyes small and in wanting pectoral fins. *G. taniola*, n. sp., *id. t. c.* p. 460, Bay of Bengal, 272 fath.

Ophichthys ascensionis, n. sp., STUDER, Forschungsreise S.M.S. 'Gazelle,' iii, p. 48, pl. xix, fig. 2, Ascension I. *O. erionthas*, p. 154, and *rugifer*, p. 155, n. spp., JORDAN & BOLLMAN, P. U. S. Nat. Mus. xii, Galapagos Archipelago.

Ophisoma nitens, n. sp., *id. t. c.* p. 153, Pacific Ocean, between the Galapagos and Panama.

✓ *Muraena* (*Rhinomuraena*, n. subg.) *quesita*, n. sp., GARMAN, Bull. Ess. Inst. xx, p. 114, fig., Marshall Is.

LOPHOBRANCHII.

Siphostoma arctum, n. sp., JENKINS & EVERMANN, P. U. S. Nat. Mus. xi, p. 137, Gulf of California.

PLECTOGNATHI.

K. MÖBIUS describes the sound-producing organ of *Balistes aculeatus*; SB. Ak. Berlin, 1889, pp. 999-1006, pl. vii.

Monacanthus melanoproctes, n. sp., BOULENGER, P. Z. S. 1889, p. 242, pl. xxviii, Muscat, Arabia.

Tetrodon: on the use of the name *Spheroides*, Lacép.; GILL, P. U. S. Nat. Mus. xi, p. 607.

- *Orthogoriscus mola*, L.: notes on two specimens captured by the 'Hirondelle'; ALBERT DE MONACO, Bull. Soc. Z. Fr. iv, p. 16, fig.

D'ARCY W. THOMPSON'S paper on the auditory labyrinth, reprinted in Stud. Mus. Zool. Univ. Dundee, i, No. 4.

INCERTÆ SEDIS.

Onchosaurus, Gerv., is based on teeth of a Teleostean, closely allied to and possibly identical with *Gigantichthys*, Dames; DAMES, JB. Mineral. 1889, i, p. 201.

Cluocycylus occidentalis, Leidy (foss.): notes by WHITEAVES, Contr. Can. Pal. i, p. 195, pl. xxvi, figs. 8 & 9.

Ancistrodon lunilimensis, p. vi, and *dumesi*, p. vii, n. spp. (foss.), DAIMERIES, P.-v. Soc. Mal. Belg. xviii, Eocene, Belgium.

CYCLOSTOMATA.

POGOJEFF, L. Ueber die Haut des Neunauges. *Arch. mikr. Anat.* xxxv. pp. 106-122, pl. v.

RETZIUS, G. Ueber die Entwicklung der *Myxine glutinosa*. *Biol. Fören. Förh.* i, pp. 22-28, pl. iii.

L. MARMIER, *Bull. Sci. Nord.* (3) ii, pp. 315-340, gives a French translation of Nansen's Memoir on *Myxine glutinosa*. (*Cf. Zool. Rec.* xlv. *Pisces*, p. 30).

Ammocoetes branchialis, L.: note by S. E. MEEK, *Am. Nat.* xliii. p. 640.

LEPTOCARDII.

LANKESTER, E. RAY. Contributions to the Knowledge of *Amphioxus lanceolatus*, Yarrell. *Q. J. Micr. Soc.* xxix, pp. 365-408, pls. xxxiv-xxxvi B.

WIJHE, J. W. VAN. Die Kopffregion der Cranioten bei *Amphioxus*, nebst Bemerkungen über die Wirbeltheorie des Schädels. *Anat. Anz.* iv, pp. 558-566.

Branchiostoma. *Amphioxus cultellus*, Pta., figured by STÜDER, Forschungsreise S.M.S. 'Gazelle,' iii, pl. xx. *Branchiostoma pelagicum*, n. sp. GÜNTHER, Challenger Shoro-Fishes, p. 43, pl. vi, fig. B, Pacific Ocean, near Honolulu.

A species of this genus is recorded from Torres Straits, by A. C. HADDON, *Nature*, xxxix, p. 286.

TUNICATA.

BY

PROFESSOR W. A. HERDMAN, D.Sc., F.L.S.

LIST OF PUBLICATIONS.

1. DAVIDOFF, M. v. Untersuchungen zur Entwicklungsgeschichte der *Distaplia magnilarva*, Della Valle, einer zusammengesetzten Ascidie. 1. Abschnitt, Die Reifung des Eies. MT. z. Stat. Neap. ix, Ht. 1. Berlin: 1889, pp. 113-178, 2 pls.
2. DELAGE, YVES. [See DUTHIERS.]
3. DUTHIERS, H. DE LACAZE, & DELAGE, YVES. Études anatomiques et zoologiques sur les Cynthiades. Arch. Z. expér. 2^{me} ser., vii, No. 3, pp. 519-528, & No. 4, pp. 529-534, pl. xxiv.
4. FEWKES, J. WALTER Zoological Excursions. 1. New *Invertebrata* from the Coast of California. Boston: 1889, p. 38.
5. FIEDLER, KARL. *Heterotrema sarasinorum* eine neue Synascidien-Gattung aus der Familie der *Distomidae*. Zool. Jahrb. iv, pp. 859-878, taf. xxv.
6. GRANGER, A. Recherche et Conservation des Tuniciers. Le Nat. 1889, pp. 172 & 173.
7. HERDMAN, W. A. Second Report upon the *Tunicata* of the L. M. B. C. District. P. Liverp. Biol. Soc. iii, pp. 240-260, pl. xiii.
8. —. The Utility of Specific Characters. Nature, xxxix, p. 200.
9. KOWALEVSKY, A. Ein Beitrag zur Kenntniss der Exkretionsorgane. Biol. Centralbl. ix, No. 2, pp. 33-47, No. 3, pp. 65-76, and No. 4, pp. 127 & 128. 1889.
10. MACMUNN, C. A. Contributions to Animal Chromatology. Quart. J. Micr. Soc. xxx, Pt. 2, July, 1889, pp. 51-96, pl. vi.
11. MORGAN, T. H. Origin of Test Cells in Ascidians. Johns Hopk. Univ. Circ. viii, p. 63.

12. SEELIGER, OSWALD. Die Entstehung des Generationswechsels der Salpen. *Jen. Z. Nat.* xxii, 1888, pp. 399-414.
13. —. Zur Entwicklungsgeschichte der Pyrosomen. *Op. cit.* Bd. xiii. 1889, pp. 595-658, pls. xxx-xxxvii.

ANATOMY.

LACAZE DUTHIERS & YVES DELAGE (3) give an account of the pyoric gland in different types of the *Cynthiidae*, and come to the conclusion that it is a special digestive gland, distinct from the liver, and combining perhaps with its principal function that of an excretory organ. They discuss the classification of the *Cynthiidae*, and state that they have found some forms presenting characters intermediate between those of *Cynthia* and those of *Styela*, such as a *Cynthia* with only 4 folds in the branchial sac. They consider it still doubtful whether the family *Polystyelidae* (Herdman) should be regarded as allied to the *Cynthiidae* or to the Compound Ascidians.

FIEDLER'S memoir on *Heterotrema* (5) is a good account of the structure of a typical Compound Ascidian, with anatomical and histological details, and a comparison with other-allied forms. There are, however, no new points of morphological importance. The new genus is closely related to *Distoma* and *Distaplia*.

PHYSIOLOGY.

In a paper dealing with the process of excretion throughout the various groups of animals, KOWALEVSKY (9, p. 75) briefly discusses the *Tunicata*. The forms he examined were *Ascidia mentula* and a species of *Molgula* found at Sebastopol. He found that indigo-carmin was fixed by the cells of the renal vesicles, in the form of little needle-like crystals, around the nuclei, exactly as in the organ of Bojanus of Mollusca. The renal organ of the Ascidians corresponds physiologically to the urinary tubules of the vertebrate kidney; while the hypophysal gland would represent only the Malpighian bodies of *Vertebrata*.

HERDMAN (8) shows that the more important diagnostic characters used in describing species of the *Tunicata* (such as the condition of the branchial sac, tentacles, &c.) are just such modifications as, being of practical importance physiologically to the animal, would be produced by the action of natural selection. In the *Tunicata*, at least, specific characters appear to be useful.

MACMUNN has investigated the chromatology of a few Simple and Compound Ascidians (10, p. 79), and finds that *Styela grossularia* owes its fine red colour to red lipochromes; while *Botryllus violaceus*, an orange-coloured *Botryllodes*, *Amaroucium proliferum*, *Clavelina lepadiformis*, and *Ascidia virginea* probably all owe their colour to lipochromes also.

DEVELOPMENT.

MORGAN (11) finds in *Cynthia partita* that the ova, the test cells, and the follicle cells are all homologous structures. The ova and follicle cells are formed from nuclei and surrounding protoplasm derived from the epithelium of the wall of the oviduct. After the ovum has enlarged, the follicle cells become arranged around it, and then some of them project into the yolk and become constricted off to form the test cells.

DAVIDOFF (1) has published the first part of an important investigation into the development of *Distaplia magnilarva*, a Compound Ascidian. This first part deals with the formation and maturation of the ovum. The chief results are as follows:—1. The structure generally known as the egg in Ascidians (*Distaplia*) is not really an ovum in the usual sense. It is rather an "ooblast," which itself produces the eggs, and consequently can be compared with the ooblast of *Appendicularia*. 2. The eggs produced by the ooblast all function as such in *Appendicularia*, while in the Ascidian only a single one of them is capable of fertilization; all the rest become abortive and are the test cells. 3. The nuclei of the eggs of the *Appendicularia*, and also of the abortive ova of Ascidians, are formed as buds from the nuclei of the ooblast, or karyoblasts. They form in the Ascidian, without the division of the nucleolus, as simple constrictions of part of the membrane and of the reticulum of the karyoblast. On the surface of the ooblast they increase, in *Distaplia*, by the karyokinetic method. 4. Later, the nuclear buds, or nucleogemmæ, are surrounded by a part of the protoplasm of the ooblast, and so become cells, and separate completely off from the ooblast. 5. The eggs of *Appendicularia* receive when constricted off a follicular investment from that with which the ooblast-complex of this animal was surrounded from the beginning. In the Ascidian the abortive eggs receive no other covering, but remain in the space between the ooblast (the egg) and the follicle epithelium. 6. This follicle epithelium consists in the Ascidians, according to Van Beneden and Julin, of those cells of the germinal epithelium which did not become the ooblast. 7. There are grounds for considering that the reduction of the eggs formed from the ooblast goes still further than is the case in Ascidians. The nucleogemmæ receive there no other specific protoplasmic coat, but become lost in the ooblast. The bud-formation of the germinal vesicle (karyoblast) often observed in *Vertebrata* is probably to be accounted for thus. 8. In later stages of division it is noticed that many of the abortive eggs of *Distaplia* are eaten by the large hypoblast cells, while others remain a long time without taking part in the tissue formation of the larva. 9. After the exit of the abortive eggs from the ooblast, the latter represents a true egg, the karyoblast a germinal vesicle. 10. The whole protoplasm of the egg breaks up into yolk bodies in such a way that no intermediate substance is left. 11. At the same time the membrane and reticulum of the germinal vesicle become dissolved in the karyoplasma and are converted into a plasmatic, actively-moving, amœba-like body—the "ergoplasma" (polplasma, Böhn)—which gradually spreads out like

rella, *Fenoulia*, *Hesperiella*, *Hungerfordia*, *Ildica*, *Kerguelenia*, *Lacynodion*, *Lacunoptyxis*, *Microlophus*, *Negulus*, *Nodiscala*, *Platychilus*, *Plesiothyrea*, *Pseudalaria*, *Pseudotaphrus*, *Ptychalea*, *Ptychopatula*, *Putzeysia*, *Robillardia*, *Rotellorbis*, *Saratiëria*, *Sphaerodoma*; and 1157 new species.

Polyplacophora: 24 new species.

Scaphopoda: 11 new species.

Pelecypoda: 9 new genera—*Astartopsis*, *Ariculomya*, *Chænocardiella*, *Ephippodonta*, *Felicia*, *Grünevaldia*, *Myophoricardium*, *Myophoriopsis*, *Pholadomyocardia*; and 250 new species.

II.—LIST OF PUBLICATIONS.*

ALDRICH, T. H. Notes upon a Collection of Shells from Borneo, with Descriptions of New Species. *J. Cincinn. Soc.* xii, pp. 23–26, pl. iii.

ANON. (1) Drei neue arotische Binnen-conchylien. *Nachr. mal. Ges.* 1889, pp. 167–170.

— (2) The *Cephalopoda*. Review of Brit. Mus. Catalogue. Part I. Nature, xxxix, pp. 530–533.

— (3) Valeur des Specimens de Conchyliologie. *Nat. Canad.* xix, pp. 145–147.

— (4) Striæ. *Naut.* iii, pp. 8 & 9.

Notes on various Shells.

ANCEY, C. F. (1) Mollusques terrestres nouveaux d'Océanie. *Le Nat.* 1889, p. 19.

Two new species.

— (2) Mollusque terrestre nouveau d'Océanie. *T. c.* p. 50.

Patula glissoni, n. sp.

— (3) Mollusque terrestre nouveau d'Océanie. *T. c.* pp. 71 & 72.

Patula monstrata, n. sp., from Viti-Levu.

— (4) Mollusque terrestre nouveau d'Océanie. *T. c.* p. 81.

Pitya hamana, n. sp.

— (5) Diagnoses de Mollusques nouveaux. *T. c.* p. 118.

Pitya seclamellata, Pfeiffer, and *Endodonta garretti*, n. sp.

— (6) Description de Mollusques nouveaux d'Océanie. *T. c.* pp. 190 & 191.

Libera lwyemanni, from Tahiti.

— (7) Description de Mollusques nouveaux. *T. c.* p. 205.

Helix anceyi, n. sp., and *Helicina altiraga*.

— (8) Description de Mollusques nouveaux. *T. c.* p. 246.

Microcystis marici, n. sp.

— (9) Diagnoses de Mollusques nouveaux. *T. c.* p. 266.

Leptachatina columna, n. sp.

* An asterisk prefixed to a quotation indicates that the Recorder has not seen the Journal or Work referred to.

[ANCEY, C. F.] (10.) Descriptions des Mollusques nouveaux. *T. c.* pp. 290 & 291.

Limnaea aulucospira and *Ostodes liberatus*.

— (11) Étude sur la faune malacologique des Iles Sandwich. *Bull. Soc. mal. Fr.* 1889, pp. 171-258.

With 21 new species.

— (12) On Mr. Pilsbry's critics upon some American Shells. *Naut.* iii, pp. 39-42.

ANDRUSSEN, N. Die Schichten von Cap Tschauda. *Ann. Hofmuseum Wien*, v, p. 66, pl. ii.

With 2 new species of *Cardium*.

AUGLAIR, M. Coquilles terrestres et fluviatiles de l'Allier. *Rev. Sci. Bourb.* 1889, pp. 48-59, 80-88, 178-194, & 220-234.

Faunal list, with description of species and synonymy. More to follow.

BAKER, F. C. (1) Notes on Floridan Shells. *Naut.* iii, pp. 53 & 54.

— (2) Description of a New Species of *Ocenebra*. *T. c.* pp. 80 & 81.

BALTET, —. Le sulfate de cuivre contre les Limaces et les Escargots. *Bull. Soc. L. Bruxelles*, xv, pp. 99 & 100.

BARROIS, C. (1) Faune du Calcaire D'Erbray. *Mém. Soc. Lille*, xvi. *Mollusca*, pp. 154-232, pls. xi-xvi.

With 26 new species, many of which are of genus *Platyceras*.

— Same paper in *Mém. Soc. géol. Nord.* 1889.

— (2) Note sur l'existence du terrain dévonien supérieur à Rostelles (Finistère). *Ann. Soc. géol. Nord.* xvi, pp. 132-142.

BATESON, W. (1) On some variations of *Cardium edule* apparently correlated to the conditions of Life. *P. R. Soc.* xlvii, pp. 204-211. Abstract in *J. R. Micr. Soc.* 1889, pp. 735 & 736.

— (2) On some variations of *Cardium edule* apparently correlated to the conditions of Life. *Phil. Trans.* 1889, B, pp. 297-330, pl. xxvi.

BAVAY, —. Addition à la Faune Malacologique terrestre et marine de la rade et des environs de Brest. *J. de Conch.* (3) xxix, p. 363.

BEDDOME, R. H. Descriptions of Land Shells from the Island of Koror, Pelew group. *P. Z. S.* 1889, pp. 112-117, pls. xi & xii.

Hungerfordia, n. g., and 8 new species.

BEHME, TH. Beiträge zur Anatomie und Entwicklungsgeschichte des Harnapparates der Lungenschnecken. *Arch. f. Nat.* 1889, i, pp. 1-28, pls. i & ii. Abstract in *J. R. Micr. Soc.* 1889, p. 628.

In *Helix pulchella*, *Buliminus pupa*, &c., a secondary ureter is absent; and this is probably true for *Limnaea*. In early embryonic life the kidneys open with the primordial kidney directly to the exterior; later by a primary ureter on the base of the pulmonary chamber into a groove formed from the wall of the pulmonary chamber. The groove later on becomes closed from behind forwards. *Helix pomatia*, in respect of its urinary apparatus, is among the highest *Pulmonata*.

BELLARDI, L. I Molluschi dei terreni terziarii del Piemonte e della Liguria. Part v. Mem. Acc. Tor. xxxix, pp. 145-194, pls. v & vi.

Mitridæ, pp. 147-158, with subdivision of the group. Critical revision of fossil *Mitridæ*, pp. 159-167. Catalogue of Tertiary *Mollusca*, pt. v. *Mitridæ*, pp. 169-181.

BENOIST, E. A. Description des Céphalopodes, Ptéropodes, et Gastéropodes Opisthobranches (*Acteonidæ*). (Coquilles, Fossiles, des Terrains Tertiaires moyens du Sud-Ouest de la France.) Act. Soc. L. Bord. xlii, pp. 11-84, pls. i-iv.

Cephalopoda, pp. 14-22 ; *Pteropoda*, pp. 23-33 ; *Gasteropoda*, pp. 34-84. Several new species.

BERGERON, J. Géologie du Rouergue et de la Montagne noire. Ann. Sci. géol. xxii, 361 pp., 9 pls. Remarques Paléontologiques, pp. 333-346, with 2 plates of Cephalopods.

BERGH, R. (1) Genera of *Aeolidiida*. J. R. Micr. Soc. 1839, p. 374.

Abstract of paper quoted in Zool. Rec. for 1888.

— (2) Reisen im Archipel der Philippinen, Theil 2. Wissen. Res. Band II. Malacologische Untersuchungen. xvi. Heft. 2nd Halb. *Nuditibranchiata* vom Meere der Insel Mauritius, pp. 815-872.

Carminodoris, n. g., *Ildica*, n. g., and 9 new species. Plates with figures of general internal anatomy.

BIZET, E. Catalogue des Mollusques observés à l'état vivant dans le département de la Somme. Mém. Soc. L. N. Fr. vii, pp. 179-239.

BLAKE, F. J. The Genus *Ascoceras*. Geol. Mag. 1889, pp. 44 & 45.

BLANCKENHORN, H. Beitrag zur Kenntniss der Binnenconchylien-Fauna von Mittel- u. Nord-Syrien. Nachr. mal. Ges. 1889, pp. 26-90.

BEHM, E. Ueber die Fauna der Schichten mit *Durga* im Departement von Sarthe. Z. geol. Ges. xl, pp. 657-665, Taf. xxvii.

A series of *Durga* and *Megalodon*, hitherto known only from the grey chalk of S. Alps, found in Jurassic of middle Europe.

BETTGER, O. (1) Ein Paar neue Fund-orte griechischer Landschnecken. Nachr. mal. Ges. 1889, pp. 23-26.

A faunal list.

— (2) Bemerkungen ueber ein Paar brasilianische Landschnecken nebst Beschreibung dreier neuer Hyalinien von dort. T. c. p. 27.

— (3) Zur Kenntniss der Land u. Süßwasser-Mollusken von Nossé Be I. T. c. pp. 41-53, with 5 new species.

— (4) Zur Mollusken-fauna der russischen Gouvernements Poltawa, Perm u. Orenburg. T. c. pp. 120-133.

— (5) Zur Mollusken-fauna von Corfu. T. c. pp. 133-138.

With 1 new species.

— (6) Eine neue Riesen-helix aus Honduras. T. c. pp. 164-166.

H. (*Odontura*) *strubelli*, n. sp.

[BETTGER, O.] (7) Neue Clausilie aus Perm. *T. c.* pp. 166 & 167.

Nenia flachi, n. sp.

— (8) Eine Fauna im alten Alluvium der Stadt Frankfurt a. M. *T. c.* pp. 187–195.

— (9) Die Binnenmollusken Transkasiens und Chorassans. *Zool. Jahrb.* iv, pp. 925–992, pls. xxvi & xxvii.

Gasteropoda, pp. 925–973, with 11 new species. General results, pp. 977–982.

— (10) Zehntes Verzeichniss von Mollusken der Kaukasusländer. *Ber. Senck. Ges.* 1889, pt. 2, pp. 3–37, 1 pl.

— (11) Die Entwicklung der Pupa-arten des Mittelrheingebietes in Zeit u. Raum. *JB. Nass. Ver.* xlii, pp. 225–327, pls. vi & vii, and an index.

An elaborate account of the cycles of variation in genus *Pupa*; with many tables. *Negulus*, n. g., *Acmopupa*, n. g., *Enneopupa*, n. g., *Ptychalaëa*, n. g., and several new species are described.

BOUCHERIE, M. Mémoire sur une Nouvelle Espèce d'*Helix*. *Ann. Soc. Char.* xxiii, pp. 79–83.

BOURGUIGNAT, J. R. Mélanidées du Lac Nyassa. Suivies d'un aperçu comparatif sur la Faune Malacologique de ce Lac avec celle du grand Lac Tanganika. *Bull. Soc. mal. Fr.* 1889, pp. 1–66, pls. i & ii.

7 new species of *Nyassia*; 7 new species of *Nyassella*; 3 new of *Nyassomelania*; 4 new of *Micronyassia*.

BOURY, E. DE. Révision des *Scalidæ* Miocènes et Pliocènes de l'Italie. *Bull. Soc. mal. Ital.* xiv, pp. 161–326, pl. iv.

Nodiscala, n. g., *Punctiscala*, n. subg., *Turriscala*, n. subg., *Clathroscala*, n. subg., *Hyaloscala*, n. subg., *Hemiacirsa*, n. subg.

BOUTON, L. Ventral Nervous Mass of *Fissurella*. *J. R. Micr. Soc.* 1889, p. 496.

Abstract of paper quoted in *Zool. Rec.* 1888.

BOUVIER, E. L. (1) Sur le Siphon Œsophagien des Marginelles. *Bull. Soc. Philom.* 8th ser., i, pp. 13 & 14.

An œsophageal siphon exists in *Marginella* as in *Halia*. It is an unpaired diverticulum of the alimentary canal, and is probably a modified condition of the gland of Leiblein.

— (2) Histoire des Janthines. *Le Nat.* 1889, pp. 65 & 66, with woodcut; *id.* 85–89, with woodcuts.

— (3) Sur l'adaptation des Animaux Marins à la vie sur Terre et dans les Eaux Douces. *T. c.* pp. 242 & 243.

BRANSIK, K. Vier neue Bythinellen aus Ungarn. *Nachr. mal. Ges.* 1889, pp. 39 & 40.

1889. [VOL. XXVI.]

BRAZIER, J. (1) Notes and Critical remarks on a donation of Shells sent to the Museum of the Conchological Society of Great Britain and Ireland. *J. of Conch.* vi, pp. 66-84.

Australasian Mollusca.

— (2) Note on the Linnean genus *Murex corneus*, found living on the coast of the Island of N. Caledonia, S. Pacific Ocean. *P. Linn. Soc. N.S.W.* iv, pp. 117 & 118.

With synonymy.

BRAUN, M. (1) Die postembryonale Entwicklung der Najaden. *Nachmal. Ges.* 1889, pp. 14-19.

— (2) Ueber parasitische Lamellibranchier. *Zusammenfassender Bericht.* *CB. Bakt. Parasit.* v, pp. 241-248, pp. 276-282.

A historical and critical account of the parasitic habit in the embryos of *Anodon* & *Unio*.

— (3) Ueber parasitische Schnecken. *Zusammenfassender Bericht.* *T. c.* pp. 444-448, 480-484, 506-511, 539-544, & 794.

A historical and critical account of parasitic Gasteropoda.

BRIART, A. Sur le genre *Trigonia* et description de deux *Trigonia* nouvelles des Terrains supra-crétacés de Maastricht et de Ciply. *Ann. Soc. mal. Belg.* xxiii, pp. 325-339, pl. xiii.

—, & CORNET. Description des Fossiles du Calcaire grossier de Mons. Part 4. *Gasteropoda, Prosobranchiata, and Pulmonata.* *Mem. Ac. Belg.* xlvii, 128 pp., 8 pls.

Prosobranchiata, pp. 1-82, with 69 new species; *Pulmonata*, pp. 83-114, with 25 new species; *Opisthobranchiata*, pp. 114-118. Alphabetical table of genera and species, pp. 119-124.

BROCK, J. (1) Zur Neurologie der Prosobranchier. *Z. wiss. Zool.* xlviii, pp. 67-83, pls. vi & vii. Abstract in *J. R. Micr. Soc.* 1889, p. 372.

When the foot has a propodial region marked, there is a better development of the anterior pedal ganglionic plexus. An account of the central nervous system in *Pteroceras*, and a general review of the nervous system in *Prosobranchiata* is given.

— (2) Bemerkungen über die Entwicklung des Geschlechtsapparates der Pulmonaten. *Z. wiss. Zool.* xlviii, pp. 84-88.

A comparison of his own researches with those of Klotz (*Zool. Rec.* 1888), and reply to critics.

BROCKMEIER, H. Ueber Bastarde von *Helix nemoralis* und *H. hortensis*. *Tag. Dent. Nat. Vers.* 1888, p. 48.

BROOKS, H. Structure of Siphon and Funnel of *Nautilus pompilius*. *J. R. Micr. Soc.* 1889, p. 495.

Abstract of paper in *Zool. Rec.* 1888.

BUCKMAN, S. S. (1) The Descent of *Sonninia* and *Hammatoceras*. *Q. J. Geol. Soc.* xlv, pp. 651-663, pl. xxii.

Sonninia is not descended from *Hammatoceras*; the latter has no trace

of ventral sulcated area. Moreover, in *Hammatoceras* the ribs meet the carina at right angles, and the suture line is specially marked by the depth and narrowness of the siphonal saddle. *Sonninia* is undoubtedly related to the common ancestor of *Amaltheus* and *Pleuroceras*. This view is explained at length, and a phylogenetic table is given. It is concluded (1) *Sonninia* and other cognate genera are correctly separated from the *Hildoceratidae*, and from *Hammatoceras* and its allies; (2) Genus *Sonninia* and cognate forms to be included in family *Amaltheidae*, or classed as a subfamily thereof. *Sonninia acanthodes*, n. sp., description and figs.; *S. subtriangulata*, n. sp., description. *Hammatoceras* is remote from *Sonninia* by descent, in spite of outward similarity. It is descended from *Deroeras*, and is therefore a cousin of *Stephanoceras*. Genus *Harpoceras*, which included forms connected merely by presence of a carina, is unnatural. *Hammatoceras dolium*, n. sp., with figures, and *H. amplexens*, n. sp., are described.

[BUCKMAN, S.S.] (2) A Monograph on the Inferior Oolite Ammonites of the British Islands. Part III. Pal. Soc. 1889, pp. 57-144, pls. xv-xxiii A.

With *Pseudolioceras*, n. g. of *Hildoceratidae*; *Hyperlioceras*, n. g. of *Hildoceratidae*; *Pacilomorphus*, n. g. of *Hildoceratidae*. 8 new species; a résumé and genealogical table.

— (3) On Jurassic Ammonites. Geol. Mag. 1889, pp. 200-204.

— (4) On the Cotteswold, Midford, and Yeovil Sands, and the Division between Lias and Oolite. Q. J. Geol. Soc. xlv, pp. 440-474.

Contains numerous lists of shells, and a table of the distribution of the *Hildoceratidae*.

BURKILL & MARSHALL. The Marine Shells of Scilly. J. of Conch. vi, pp. 53-59.

CAMPBELL, J. H. Notes on the genus *Cypræa*. Naut. iii, pp. 10 & 11.

CANDLER, C. Observations on some undisturbed Lacustrine deposits at Saint Cross, in Suffolk. Q. J. Geol. Soc. xlv, pp. 504-510.

With a list of *Mollusca*.

CARPENTER, H. F. (1) The Shell-bearing *Mollusca* of Rhode Island. Naut. pp. 11, 12, 21-23, 32, 33, 44, 45, 56-59, 69-71, 82, 83, & 92-95. Chap. xlv, *Cyrenidae*, *Cardiidae*, &c.

— (2) Notes on *Valvata* (*Lyogyrus brownii*). Naut. iii, p. 67.

CARUS, J. V. Prodrömus Faunæ Mediterraneæ. Vol. II, pars. I. Stuttgart: 1889. *Mollusca*, pp. 62-272.

General and special distribution of Mediterranean *Mollusca*.

CATTANEO, E. Sulla Morfologia delle Cellule Ameboidi dei Molluschi ed Artropodi. Boll. Scient. xi, pp. 1-29, with a fig.

CAYEUX, L. Note sur le crétacé de Chercq près Tournay. Ann. Soc. géol. Nord. xvi, pp. 142-156, with woodcuts.

CHRISTY, M. Notes on an Alluvial Deposit in the Cann Valley, with a list of the *Mollusca* occurring therein. Tr. Ess. Club, iii, pp. 1-10.

COCKERELL, T. D. A. (1) Some North of England *Mollusca*. *Naturalist*, 1889, p. 320.

— (2) Preliminary remarks on the Molluscan Fauna of Colorado. *J. of Conch.* vi, pp. 60–65.

— (3) The Virginia Colony of *Helix nemoralis*. *Naut.* iii, pp. 73–77.

— (4) Notes on the variation of certain *Mollusca* introduced from Europe. *T. c.* pp. 86 & 87.

COLLIER, E. List of Shells collected at Ingleton and district during August, 1888. *J. of Conch.* vi, pp. 40–45.

COOKE, A. H. (1) On the generic position of the so-called *Physæ* of Australia. *P. Z. S.* 1889, pp. 136–143, woodcuts of the teeth.

They are not *Physæ*, but a group of sinistral *Limnæidæ*, of genus *Bulinus*, Adams, 1857.

— (2) On the relationships and geographical distribution of the Land and Freshwater *Mollusca* of the Palearctic and Nearctic regions. *P. Cambr. Phil. Soc.* vi, pp. 334 & 335.

The freshwater *Mollusca* afford strong evidence for a Holarctic province.

— (3) On the Varieties and Geographical Distribution of the common Dog-whelk (*Purpura lapillus*, L.). *Op. cit.* vii, p. 13.

Colour variation not explained; shape variation depends on locality. *i.e.*, on exposed coasts, shells are stunted, with a short spire and large mouth.

COOPER, J. G. West Coast *Pulmonata*, Fossil and Living. *P. California Ac. Sci.* i, pp. 11–24.

COSSMANN, M. Catalogue illustré des Coquilles fossiles de l'Éocène des environs de Paris. *Ann. Soc. mal. Belg.* xxiii, pp. 3–324, 12 pls.

Scaphopoda, pp. 6–13, with 4 new species; *Gastropoda*, pp. 14–320; *Calliomphalus*, n. g. of *Delphinulidæ*; *Boutilliera*, n. g. of *Trochidæ*; *Platychilus*, n. g. of *Trochidæ*; *Discobasis*, n. g. of *Trochidæ*; *Camariscula*, n. g. of *Trochidæ*; *Rotellorbis*, n. g. of *Trochidæ*; *Escharella*, n. g. of *Naricidæ*; *Cymenorytis*, n. g. of *Naricidæ*; *Plesiothyreus*, n. g. of *Capulidæ*; *Dialopsis* and *Diastictus*, n. gg. of *Rissoidæ*; *Pseudotaphrus*, n. g. of *Rissoidæ*; *Carilabium*, n. g. of *Littorinidæ*; *Dissochilus*, n. g. of *Littorinidæ*; *Lacunodon*, n. g.; *Lacunophyeis*, n. g. of *Littorinidæ*; *Bouryia*, n. g. of *Melaniidæ*; *Eligmostoma*, n. g. of *Turritillidæ*; and 12 new species.

COX, J. C. Note on *Cypræa venusta* (Sowerby). *P. Linn. Soc. N.S.W.* iv, p. 187, pl. xv, figs. 1 & 2.

CRAGIN, F. W. Contributions to the Palæontology of the Plains. *Bull. Washb. Coll.* ii, pp. 65–68.

With 3 new Lamellibranchs.

CRAWSHAW, C. (1) Conchological Note. *Wesley Nat.* ii, pp. 322–373. On genus *Triton*.

— (2) Conchology. *Neritidæ*. *Op. cit.* iii, pp. 120 & 121.

Note on the shells.

CROSSE, H. Note sur le nouveau genre *Livinhacia*. J. de Conch. (3) xxix, pp. 105-112.

With a catalogue of the species.

CROSSE, —, & FISCHER, —. Note sur la Faune Conchyliologique marine de l'Annam. T. c. pp. 281-296.

CUÉNOT, L. Sur les Glandes Lymphatiques des Céphalopodes et des Crustacés décapodes. C.R. 1889, i, pp. 863-865. Abstract in J. R. Micr. Soc. 1889, p. 495.

The so-called branchial gland is not lymphatic, and no trace of leucocyte formation is to be found in it. The real lymphatic gland is attached to the branchial heart by a short thin pedicle. CUÉNOT found it in *Sepia officinalis*, *S. elegans*, *Sepiola rondeletii*, *Octopus vulgaris*, *Eledone moschatus*.

CUNDALL, J. W. Shells taken at Tenby. J. of Conch. vi, pp. 102-106.

DALL, W. H. (1) Abranchiate Lamellibranchia. J. R. Micr. Soc. 1889, p. 740.

Abstract of paper in Zool. Rec. 1888.

— (2) Notes on the Anatomy of *Pholus costata* and *Zirphæa crispata*. P. Ac. Philad. 1889, pp. 274-276.

Description of the soft parts.

— (3) Notes on the soft parts of *Trochus infundibulum*, Watson, with an account of a remarkable sexual modification of the epipodium. Naut. iii, pp. 2-4.

— (4) Notes on *Lophocardium*, Fischer. T. c. pp. 13 & 14.

— (5) Note on two *Helices* new to the fauna of the United States. T. c. p. 25.

— (6) On the genus *Corolla*, Dall. T. c. pp. 30-32.

— (7) A preliminary Catalogue of the Shell-bearing Marine Molluscs and Brachiopods of the S.E. Coast of the United States. 221 pp., 74 pls. Bull. U. S. Nat. Mus. 1889.

— (8) On the Hinge of Pelecypods and its development, with an attempt toward a better subdivision of the group. Am. J. Sci. xxxviii, pp. 445-462.

The current divisions based on muscles or gills are not mutually exclusive. There are three types of hinge : 1, simple edentulous margin closing by simple apposition of the two valves ; 2, hinge in which the teeth are developed transverse to the cardinal margin ; 3, hinge with the direction of the teeth parallel to the margin. The first condition is the oldest, and is passed through by many larval bivalves. The mechanism of the hinge and valves is discussed, and Lamellibranchs are grouped under three orders corresponding to the three kinds of valves : I. Order *Anomalodesmacea* (*Solenomyacea*, *Anatinacea*, *Myacea*, *Ensyphonacea*, *Adesmacea*) ; II. *Prionodesmacea* (*Nuculacea*, *Arcacea*, *Naiadacea*, *Trigoniacea*, *Mytilacea*, *Pectinacea*, *Anoniaceu*, *Ostracea*) ; III. *Teleodesmaceu* (*Tellinacea*, *Solenacea*, *Mactracea*, *Carditacea*, *Cardiacea*, *Chamacea*, *Tridacnacea*, *Leptonacea* ? *Lucinacea*, *Isocardiacea* ? *Veneracea*, ? *Rudista*).

In a supplementary note the author compares his work with Neumayr's, and discusses the affinities of the Rudista.

DALLA TORRE, K. W. Die Fauna von Helgoland. II. Supplement to Zool. Jahrb. 99 pp.

Mollusca, pp. 47-54.

DANIEL, F. Deuxième supplément à la Faune Malacologique terrestre, fluviatile e marine de la rade, et des environs de Brest (Finistère). J. de Conch. (3) xxix, pp. 219-225.

DEPERET, C. Description, paléontologie et classification des étages tertiaires de la côte de Carry. Ann. Soc. Agric. Lyon (6) i, pp. 49-116, pls. i & ii.

DEWITZ, H. Hilfskammerwände Silurischer Cephalopoden. Zool. Anz. 1889, pp. 147-152. Abstract in Q. J. Micr. Soc. 1889, p. 369.

DOHRN, H. Beitrag zur Conchylien-fauna der philippinischen Insel Palawan. Nachr. mal. Ges. 1889, pp. 53-63.

With 6 new species.

DOLIFUSS, G. F. Coquilles nouvelles ou mal connues du Terrain tertiaire du Sud-Ouest. Bull. Soc. Borda-Dax, 1889, pp. 218-226, woodcuts.

Contains description of 3 new species of *Nassa*.

DONALD, MISS. Descriptions of some New Species of Carboniferous Gasteropods. Q. J. Geol. Soc. xlv, pp. 619-625, pl. xx.

Orthonema pygmaeum, n. sp. (with figs.); *O. youngianum*, n. sp. (with figs.); *Murchisonia turriculata* (with fig.), *id.* var. *notica* (with fig.); *M. (Goniostropha) subtilistriata*, n. sp. (with figs.); *M. (Stegocalia) compacta*, n. sp. (with figs.).

DOUVILLÉ, H. Sur quelques Rudistes du terrain crétacé inférieur des Pyrénées. Bull. Soc. géol. xvii, pp. 627-653, pls. xv & xvi, many woodcuts.

2 new species.

DROUET, H. *Unionide* du Bassin du Rhone. Mém. Ac. Dijon (4) i, pp. 27-114, 3 pls.

Contains an account of the distribution and origin of the *Unionide* fauna of the Rhone valley; and a list of species, with description and several figures of Anodons and Unios.

DUBOIS, R. (1) Remarques sur la Physiologie et l'Anatomie du Siphon du *Pholas ductylus*. C.R. Soc. Biol. (9) i, pp. 521-523.

— (2) Sur le Mécanisme des Fonctions Photodermatique et Photogénique dans le Siphon du *Pholas ductylus*. Op. cit. 1889, ii, pp. 233-235. Abstract in J. R. Micr. Soc. 1889, p. 736.

Contraction of the siphon under the stimulus of light due to a continuous coat of pigmented epithelial cells on the siphon and to muscular processes from these cells which form a layer under the epithelium.

— (3) Sur l'action des Agents Modificateurs de la Contraction Photodermatique chez le *Pholas ductylus*. T. c. pp. 320-322.

Influence of temperature, fatigue, light, colour, &c.

ECKSTEIN, K. Repetitorium der Zoologie. Leipzig: Engelmann, 1889, 303 pp. *Mollusca*, pp. 145-157, with woodcuts.

An elementary text-book.

EUTHYME, M. LE FRÈRE. Description de quelques espèces nouvelles de la faune marine Exotique. Bull. Soc. mal. Fr. 1889, pp. 259-282, pls. vi & vii.

5 new Gasteropods from New Caledonia and Cape of Good Hope.

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Description of this new species from the Arcachon.

— (2) Découverte d'un Nouveau Type de Mollusques Gastropodes entoparasites (*Entocolax*). *J. de Conch.* (3) xxix, pp. 101-105.

FISCHER, P. Note sur l'habitat anormal de quelques Mollusques aquatiques de la Vallée de Canterets (Hautes-Pyrénées). *T. c.* pp. 217-219.

FITZGERALD, F. R. Land and Freshwater *Mollusca* of Harrogate and District. *J. of Conch.* vi, pp. 18-30.

FLORENCE, M. LE FRÈRE. Mollusques de la Montagne de Notre-Dame-des-Anges Chaine des Maures. Bull. Soc. mal. Fr. 1889, pp. 325-344.

DE FOLIN, MARQUIS. (1) Note sur l'*Anodonta piscinalis* var. *vetula*. *Le Nat.* 1889, p. 243.

— (2) Observations sur l'*Unio moriscottei*, n. sp. *T. c.* p. 245, woodcut.

FOORD, A. H. Note on the Deciduous Septa of *Ascoceras purchisoni*, Barraude. *Geol. Mag.* 1889, pp. 121-123, woodcut.

— & CRICK. On the Muscular Impression of *Celonautilus cariniferus*, J. de C. Sowerby, sp., compared with those of the recent *Nautilus*. *T. c.* pp. 494-498, woodcuts.

FORD, J. (1) List of Shells of the New Jersey Coast south of Brigantine Island. *Naut.* iii, pp. 27 & 28.

— (2) *Scalaria angulata* in New Jersey. *T. c.* pp. 52 & 53.

— (3) On *Crepidula glauca*. *T. c.* pp. 90-92.

— (4) Description of *Helix (Trachia) dentoni*, n. sp. *T. c.* pp. 17 & 18, woodcut.

— (5) Remarks on *Oliva inflata*, *O. irisans*, and other species of *Shella*. *P. Ac. Philad.* 1869, pp. 137 & 138.

On nomenclature.

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FRECH, F. Ueber *Mecynodon* und *Myophoria*. *Z. geol. Ges.* xli, pp. 127-138, pl. xi.

2 new species.

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Contains some woodcuts of *Mollusca* (Chitons, Cephalopods) and many references to their habits and modes of life.

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With lists of shells and notes by W. H. DALTON.

FRIČ, A. Studien im Gebiete der Böhmisches Kreideformation. iv. Die Teplitzer Schichten. Arch. naturw. Landesforsch. Böhmen, vii, pp. 1-120, many woodcuts.

With many lists of fossils, and with descriptions and woodcuts of characteristic forms.

GAIN, W. A. A few Notes on the Food and Habits of Slugs and Snails. Naturalist, 1889, pp. 55-59.

GALEAZZI, R. Nervous Elements of Adductor Muscles of Lamellibranchs. J. R. Micr. Soc. 1889, p. 201.

Abstract of paper quoted in Zool. Rec. 1888.

GALLENSTEIN, H. R. VON. (1) Die Bivalven des Isonzogebietes. Nachr. mal. Ges. 1889, pp. 65-76.

— (2) Beiträge zur Kenntniss der Conchylien-Fauna Kärntens. JB. Mus. Kärnt. xx, pp. 245-248.

Short faunal list.

GANONG, W. F. (1) Marine *Mollusca* of New Brunswick. Bull. Nat. Hist. Soc. New Brunswick, vi, pp. 17-61.

A classified faunal list.

— (2) On the Economic *Mollusca* of Acadia. *Op. cit.* viii, pp. 3-116, many woodcuts.

Contains a general introduction; a popular account of Molluscs as food, bait, &c.; and then an account, with figures, of the useful Molluscs in the district.

GARMAN, H. A preliminary report on the Animals of the Waters of the Mississippi Bottoms near Quincey, Ill. Springfield, Ill.: 1889, 53 pp.

Mollusca, pp. 23-27; no new species.

GARNAULT, P. (1) Sur les phénomènes de la Fécondation chez *PHelix aspersa* et *l'Arion empiricorum*. Zool. Anz. 1889, pp. 10-15. Abstract in J. R. Micr. Soc. 1889, p. 372. Continuation.

— (2) Sur les Organes Reproducteurs de la *Valvata piscinalis*. *T. c.* pp. 266-269, woodcut. Abstract in J. R. Micr. Soc. 1889, p. 498.

GARSTANG, W. Report on the Nudibranchiate *Mollusca* of Plymouth Sound. J. Mar. Biol. Ass. i (n.s.) pp. 173-198. Abstract in J. R. Micr. Soc. 1889, p. 737.

Faunal list. Notes on colour. *Archidoris tuberculata* is protected by colour resemblances to the sponge on which it feeds and to the tints of

sea-weeds. *A. johnstoni* mimics exactly *Halichondria panicea* and *Æolis papillosa* mimics *Sagartia parasitica*. The bright colours are often confined to the papillæ, and are serviceable in distracting the experimental attacks of inexperienced enemies from more vital parts. One new species, *Lomanotus varians*, is described.

GIARD, A. *Sepiols* of the French Coasts. Ann. N. H. 1889, ii, pp. 181-183.

Full abstract with analytical key.

GIOLI, G. I Lamellibranchi e la Sistematica in Paleontologia. Bull. Soc. mal. Ital. xiv, pp. 101-143.

Lamellibranchs divided into :—

Order I.

(a. *Homomyariæ*.)

Palæoconchæ—*Cryptodontæ*.

Order II. *Desmodontæ*.

Suborder. *Tubicolæ*

Order III. *Taxodontæ*.

Order IV. *Heterodontæ*.

Suborder. *Trigonidæ*.

Order V. *Anisomyariæ*—*Dysodontæ*.

(ß. *Heteromyariæ*.)

(γ. *Monomyariæ*.)

Several genealogical trees given.

GIRARD, A. A. Note sur les *Helix cutocyphia*, Bourg., *hyperplatæa*, Servain, et *pisana* du Portugal. J. Sci. Lisb. xlvii, pp. 160-166, with pl.

GODWIN-AUSTEN, H. H. (1) Description of a supposed new species of *Helix* from near Moulmain, Tenasserim. Ann. N. H. 1889, i, pp. 107 & 108.

Description of *Helix* (*Ægista*) *mitanensis*, n. sp.

— (2) On a Collection of Land-Shells made in Borneo by Mr. A. Everett, with descriptions of supposed new species. Part I. *Cyclostomacæ*. P. Z. S. 1889, pp. 332-355, 5 pls.

34 new species.

GOLDFUSS, —. Das Vorkommen der italienischen *Helix cingulata*. Z. Naturw. 1889, p. 202.

GOURDON, M. Contributions à la Faune Malacologique de l'Aragon. Bull. Soc. mal. Fr. 1889, p. 315-324.

GRANGER, A. (1) Récolte et Préparation des Mollusques. Le Nat. 1889, pp. 195-197 & 206-209, woodcuts.

— (2) Installation d'une Collection Conchyliologique. T. c. pp. 220 & 221.

GREDLER, V. Zur Conchylien-Fauna von China. Nachr. mal. Ges. 1889, pp. 155-163.

With 6 new species.

[GREDLER, V.] (2) Kritische Fragmente. *T. c.* pp. 195-202.

On *Helix* (*Campylæa*) *tiesenhauseni*, n. sp., *Pupa* (*Sphyradium*) *spinelli*, n. sp.

GREENE, C. (1) Dorsetshire Marine Shells. *J. of Conch.* vi, pp. 110 & 111.

— (2) Materials for a Molluscan Catalogue of Suffolk. *T. c.* p. 246.

DE GREGORIO, A. (1) Note on *Pleurotoma turbida*, Solander, and *P. colon*, Sav. *Geol. Mag.* 1889, p. 78.

— (2) Esami di taluni Molluschi viventi e terziari del Bacino Mediterraneo. *Nat. Sicil.* viii, pp. 248-256, pl. ii, & 275-292, pls. iv & v.

GRENACHER, H. The Heteropod Eye. *J. R. Micr. Soc.* 1889, p. 196.

Abstract of paper quoted in *Zool. Rec.* 1888.

GREPPIN, E. Description des Fossiles de la Grande Oolithe des Environs de Bâle. *Mem. Soc. Pal. Suisse*, xv (Geneva: 1888), 137 pp., 10 pls.

Gasteropoda, pp. 13-86, with 23 new species and many figures. *Lamelli-branchiata*, pp. 87-130, with 10 new species.

GRIEPENKERL, O. Die Versteinerungen der Senonen Kreide von Königs-lutter im Herzogthum Braunschweig. *Pal. Abh.* iv, heft 5, pp. 1-116, 12 pls.

With 22 new species.

GROSSOUVRE, DE. Sur le Terrain Crétacé dans le Sud-Ouest du Bassin de Paris. *Bull. Soc. géol.* xvii, pp. 475-533, pls. xi & xii.

With 1 new Ammonite.

HALLER, B. Beiträge zur Kenntniss der Textur des Central-Nervensystems höheren Würmer. *Arb. z. Inst. Wien.* viii, 2, pp. 1-138.

In the general results (pp. 106-138) many references to the nervous system in *Mollusca*.

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Short account of the anatomy of these forms.

HARTMAN, W. D. New Species of Shells from New Hebrides. *P. Ac. Philad.* 1889, pp. 91-94, pl. v.

10 new species.

HEDLEY, C. (1) On *Ancileta graffei* and its Allies. *P. R. Soc. Queensl.* v, pp. 162-173, pl.

A review of the nomenclature and a short account of the anatomy.

— (2) Anatomical notes on the *Helicidae*. *Op. cit.* vi, pp. 62 & 63, pl. On the anatomy of *Thersites richmondii*.

— [See SAVILE-KENT.]

[HEDLEY, C.] (3) Anatomical notes on the *Helicidæ*. *T. c.* pp. 120, 121, & 249-251, pls.

Notes on *H. porteri*, *H. delta*, *H. perinflata*, *H. rainbirdi*, *H. pachystyla*, and *Bulimus mastersi*.

— (4) Notes on Queensland Land-Shell. *T. c.* pp. 100-103, figs.

HEILPRIN, A. (1) The Bermuda Islands. Philadelphia: 1889, 232 pp., 17 pls.

Relationship of Bermudan fauna, pp. 78-96, with lists of peculiar species. Bermudan fauna is essentially due to wind-drift and current-drift, chiefly from United States and Antilles. The large proportion of peculiar terrestrial *Mollusca* makes extreme antiquity of the fauna probable. The predecessor of the peculiar Pulmonate group is found fossil or sub-fossil on the island. *Mollusca*, pp. 166-190, 3 pls., with 11 new species. On the Helicoid Land Mollusca of Bermuda, by H. A. PILSBRY, pp. 191-201, with description of species and figures of *Pacilonites*.

— (2) On some new species of *Mollusca* from the Bermuda Islands. *P. Ac. Philad.* 1889, pp. 141 & 142, pl. viii.

7 new species of *Lamellibranchiata*.

HERDMAN, W. A., & CLUBB, J. A. Second Report on the *Nudibranchiata* of the L. M. B. C. District. *P. Liverp. Biol. Club*, iii, pp. 225-239, pl. xii.

Faunal notes; and notes on anatomy of *Dendronotus arborescens* and *Æolis*.

HEUDE, R. P. M. (1) Diagnoses Molluscorum novorum in Sinis collectorum. *J. de Conch.* (3) xxix, pp. 40-50.

With *Delaraya*, n. g., and *Fenouilia*, n. g. (*Helicidæ*), and 15 new species.

— (2) Diagnoses Molluscorum novorum in Sinis collectorum. *T. c.* pp. 225-229.

With 11 new species.

HEY, T. List of Land and Freshwater Shells of Derbyshire: collected in 1888. *J. of Conch.* vi, pp. 116-122.

HIDALGO, J. G. Espèces nouvelles ou peu connues de Coquilles Terrestres des Îles Philippines. *J. de Conch.* (3) xxix, pp. 296-306, pls. xiii-xv.

With 7 new species.

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HOLZAPFEL, E. (1) Die Mollusken der Aachener Kreide. *Palæontogr.* xxxv, pp. 138-268, pls. viii-xxix. Continuation and conclusion.

Lamellibranchiata, pp. 138-256, with 18 new species. Table and index, pp. 257-268.

[HOLZAPFEL, E.] (2) Die Cephalopoden-führenden Kalke des unteren Carbon von Erdbach-Breitscheid bei Herborn. Pal. Abh., n.f. 1, heft. i, pp. 1-74, 8 pls.

With *Hespericella*, n. g., allied to *Pleurotomaria*; *Aviculomya*, n. g., *Chenocardiola*, n. g., and 13 new species.

HOYLE, W. E. (1) Observations on the Anatomy of a rare Cephalopod (*Gonatus fabricii*). P. Z. S. 1889, pp. 117-135, pls. xiii & xiv.

Account of the anatomy: funnel organ is probably a valve for closure of funnel. A table of the relations to *Onychoteuthis* and *Enoploteuthis*. Subfamily *Gonatidae* established.

— (2) On a tract of modified Epithelium in the Embryo of *Sepia*. P. Phys. Soc. Edinb. x, pp. 58-60, with a woodcut.

A trifid patch on posterior aspect of the body; probably glandular.

— (3) On the Deep-water fauna of the Clyde Sea-area. J. L. S. xx, pp. 442-472, with a map.

Faunal lists.

HUDLESTON, W. H. A monograph of the British Jurassic *Gasteropoda*. Pal. Soc. 1889. Part 1, No. 3, *Gasteropoda* of the Inferior Oolite, pp. 137-192, pls. vii-xi.

Pseudalaria, n. g. (allied to *Cerithium*), and 22 new species.

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HUTTON, F. W. Description of a new Land Shell from the Province of Nelson. Tr. N. Z. Inst. xx, pp. 43 & 44.

IHERING, H. VON. *Philomycus* and *Pallifera*. Nachr. mal. Ges. 1889, pp. 5-12 & 33-38.

ISSEL, A. Di una *Sepia* del Pliocene Piacentino. Bull. Soc. mal. Ital. xiv, pp. 157-160, with woodcuts.

JACKSON, R. T. The Development of the Oyster, with remarks on Allied Genera. P. Bost. Soc. xxiii, pp. 531-556, 4 pls.

General development of the soft parts; development of the shell.

JÄKEL, O. Ueber einen Ceratiten aus dem Schaumkalk von Rüdersdorf u. über gewisse als Hafring gedeutete Eindrücke bei Cephalopoden. JB. Mineral, 1889, ii, pp. 19-31, with taf. i.

JATTA, G. (1) Elenco dei Cefalopodi della 'Vettor Pisani.' Boll. Soc. Nat. Napoli, iii, pp. 63-67.

With one new *Octopus*.

— (2) La Innervazione delle Braccia dei Cefalopodi. T. c. pp. 129-132.

Innervation of the arms of Cephalopods.

JOUSSEAUME, F. (1) Mollusques du Venezuela. (Voyage du M. Eugène Simon.) Mém. Soc. Zool. ii, pp. 232-259, pl. ix.

[JOUSSEAU, F.] (2) Espèces nouvelles des environs d'Aden: Suivies d'un aperçu sur la Faune Malacologique de la Péninsule Arabique. Bull. Soc. mal. Fr. 1889, pp. 345-362.

4 new species.

KARAKASCH, N. Ueber einige Neocomablagerungen in der Krim. SB. Ak. Wien, abth. I, xcvi, pp. 428-438, 2 pls.

6 new species of Ammonites, and a list of fossils.

KARLINSKI, —. Le rôle des Escargots et des Limaces dans la propagation du Charbon. Rev. Sci. xvii, p. 125.

Abstract translation from the Centralblatt.

KARPINSKY, A. Ueber die Ammoniten der Artinsk-Stufe und einige mit denselben Carbonische Formen. Mém. Ac. Pétersb. xxxvii, 2, 105 pp., 5 pls.

Description of forms, pp. 4-41, with woodcuts and 4 new species. Relation of forms, with tables and figures, pp. 41-45. Descriptions, pp. 45-83, with 11 new species. Geological conclusions, pp. 85 to end.

KAYSER, E. Ueber einige neue oder wenig gekannte Versteinerungen des rheinischen Devon. Z. geol. Ges. xli, pp. 288-926, pls. xiii & xiv.

With several new species: Gasteropods and Brachiopods, and 1 new genus, *Spirina*, allied to *Naticella*.

KEEP, J. Summer Studies in Conchology. Naut. iii, pp. 54-56.

KERMODE, P. M. C. Fossil shells from the Boulder Clay and Sand, North Ramsey. Vannin Lioar, i, pp. 96-98.

KEYES, C. R. (1) An Annotated Catalogue of the *Mollusca* of Iowa. Bull. Ess. Inst. xx, pp. 61-83.

— (2) On the attachment of *Platyceras* to Palæocrinoids, and its Effects in modifying the Form of the Shell. P. Am. Phil. Soc. xxv, pp. 231-243, 1 pl.

The Gasteropod attached itself at the anus of the Crinoid, and probably fed chiefly on excreted matter. 4 new species of *Platyceras* are described.

— (3) Lower Carbonic *Gasteropoda* from Burlington, Iowa. P. Ac. Philad. 1889, pp. 281-298.

No new species.

— (4) The American Species of *Polyphemopsis*. T. c. pp. 299-302. Really belong to *Bulimorpha* of Whitfield.

— (5) *Sphaerodoma*: a genus of Fossil Gasteropods. T. c. p. 303.

— (6) *Soleniscus*: its Generic Characters and Relations. Am. Nat. 1889, pp. 420-424, pl. xx.

Macrocheilus genus is criticized, *Soleniscus* is redefined, and a number of *Macrocheili* are transferred to *Soleniscus*.

— (7) Variations exhibited by a Carbonic Gasteropod. Am. Geol. iii, pp. 330-333, with a woodcut.

[KEYES, C. R.] (8) The Subgeneric Groups of *Naticopsis*. *Op. cit.* iv, pp. 193-196, with woodcut.

—. (9) Distribution of *Helicina occulta*. *Naut.* iii, pp. 18 & 19.

KOBBLT, W. (1) Ein neuer *Iberus* aus Marocco. *Nachr. mal. Ges.* 1889, pp. 12-14.

Helix (Iberus) viola, Ponsouby.

—. (2) Iconographie der Schalen-tragenden europäischen Meeres-conchylien. Heft ix u x, pp. 17-40, pls. xxxiii-xxxvi.

—. (3) Diagnosen neuer Arten. *Nachr. mal. Ges.* 1889, pp. 138-141.

5 new species of *Helix*.

KÖENEN, A. VON. Das Nord-deutsche Unter-Oligocän u. seine Mollusken-Fauna. *Abh. geol. Spec. Preus. u. Thüring.* x, heft. 1, 280 pp. and 23 pls.

On *Gasteropoda prosobranchiata*, with 60 new species.

KÖKEN, E. Ueber die Entwicklung der Gastropoden vom Cambrium bis zur Trias. *JB. Mineral.* 1889, Beilage-Band vi, pp. 305-484, pls. x-xiv, 26 woodcuts.

An elaborate treatise on phylogenetic development in *Gasteropoda*.

KOWALEVSKY, A. Beitrag zur Kenntniss der Exkretionsorgane. Mollusken. *Biol. Centralbl.* ix, pp. 66-70.

Account of physiological experiments. Both organ of Bojanus and pericardial glands excrete.

KRAVKOV, N. P. O pishchevarenii y vis-shikh bezpozvonochnykh zhivotnykh. (On the digestion of the higher *Invertebrata*.) *Trudni St. Petersburg Nat.* xx, pp. 68-80.

Lamellibranchiata, pp. 77 & 78. (Russian only, but no original matter.)

LAGATE, H. Caractères distinctifs de l'Espèce et du Sexe dans les Coquilles Types de quatre *Sepia*. *Act. Soc. L. Bord.* xlii, pp. 105-120, pls. vi-ix.

There are 4 species of *Sepia*, differing in the shell, in size, shape, striae, granulations, &c. In each of these, sex may be determined from shape of hollow and of dorsal profile.

LAMPLUGH, G. W. On the Subdivisions of the Speeton Clay. *Q. J. Geol. Soc.* xlv, pp. 575-618.

With many lists of fossils and 2 tables.

LANGDON, D. W. Some Florida Miocene. *Am. J. Sci.* xxxviii, pp. 322-324.

With lists of shells, &c. In the oldest bed of Chattahoochee group occurs an oyster very like the recent *Ostrea virginica*.

LEIDY, J. Remarks on the Nature of Organic Species. *Tr. Wagner Inst. Philad.* ii, pp. 51-53, pls. ix & x.

Figures show the derivation of modern *Fulgus perversus* from fossil *F. contrarius*.

LETELLIER, A. (1) De la Fonction Urinaire chez les Mollusques Acéphales. Bull. Soc. L. Norm. 4, i, pp. 316-321.

— (2) Recherches sur la Pourpre produite par le *Purpura lapillus*. C.R. 1889, ii, pp. 82-85. Abstract in J. R. Micr. Soc. 1889, p. 627.

A physical investigation. Purple is produced by a band of ciliated cells on the rectum.

— (3) Étude de la Fonction Urinaire chez les Mollusques Acéphales. Rev. Sci. xvi, pp. 435 & 436.

A study in physiological chemistry. Creatinin, tyrosin, leucosin, &c., found in organ of Bojanus of *Anodonta cygnea*, *Cardium edule*, *Cyclas corneus*. The concretions so often present were found in the case of *Cytherea chione* to be composed of oxalate of lime, phosphates, but no urea or uric acid.

LIENENKLAUS, E. Verzeichnis der bis jetzt aus dem Regierungsbezirk Osnabrück bekannten Mollusken. J. Ber. Ver. Osnabr. vii, pp. 33-66, 1 pl.

Faunal list. Figures of *Calycertina lucustris*, var. *rotundata*.

LOCARD, A. (1) Revision des Espèces Françaises appartenant au genre *Mytilus*. Bull. Soc. mal. Fr. 1889, pp. 83 & 164, pls. iii-v.

— (2) Matériaux pour servir à l'histoire de la Malacologie Française. T. c. pp. 283-307.

On the French species of *Circulus*, 3 new.

— (3) Catalogue des Espèces françaises appartenant aux genres *Margaritana* et *Unio*. Ann. Soc. L. Lyon, xxxv, pp. 111-269.

Catalogue, pp. 120-178. Notes and descriptions of species, pp. 178-269. Index given.

— (4) Monographie des Espèces françaises appartenant au genre *Valvata*. T. c. pp. 285-342. With index and comparative table.

— (5) French Malacology. Q. J. Micr. Soc. 1889, p. 733.

Abstract of various papers in Ann. Soc. L. Lyon, xxxii, xxxiii, & xxxiv.

LOFTHOUSE, T. A. *Clausilia rugosa*, var. *dubia*, with Double Mouth in Wensleydale. Naturalist, 1889, p. 244.

LORIOI, P. DE. Études sur les Mollusques des Couches Coralligènes de Valfin (Jura). Mém. Pal. Suisse, xiii, xiv, & xv, 369 pp., 37 pls.

Stratigraphical notice by Bourgeat, pp. 7-34. *Cephalopoda* and *Gastropoda*, pp. 35-224. *Lamellibranchiata*, pp. 224-334. Many new species.

MABILE, I. Description du nouveau genre *Chlorostracia*. Bull. Soc. mal. Fr. 1889, pp. 309-314, pl. viii.

MALARD, A. E. Structure de l'Appareil Radulaire (odontophore) des Cypréides. Bull. Soc. Philom. 8, i, pp. 65-69, woodcut.

Special account of the muscles of the radula.

MAGNUS, P. Ueber die Beziehungen von Schnecken und Pflanzen. SB. nat. Fr. 1889, pp. 16-18, & 197 & 198.

Many plants fertilized by snails.

MARQUAND, E. D. The Land and Freshwater *Mollusca* of S. Devon. *J. of Conch.* vi, pp. 136-140.

MARSH, W. A. (1) Brief Notes on the Land and Freshwater Shells of Mercer Co., Illinois. *Naut.* iii, pp. 23 & 24.

— (2) Brief Notes on the Land and Freshwater Shells of Mercer Co., Illinois. *T. c.* pp. 34 & 35.

MARSHALL, J. T. On *Hydrobia* and *Assimix* from the Thames Valley. *J. of Conch.* vi, pp. 140-142.

MARTENS, E. VON. (1) Griechische Mollusken. Gesammelt von Eberh. v. Oertzen. *Arch. f. Nat.* 1889, i, pp. 169-240, pls. ix-xi.

With an index and 3 tables of distribution. 14 new species figured.

— (2) Recente Schnecken-Schalen mit abnormen scharfen Einschnitten der Nabelgegend. *SB. nat. Fr.* 1889, pp. 8 & 9.

— (3) Ueber das Wiederaufleben von Landschnecken. *T. c.* p. 159.

— (4) Südafrikanische Landschnecken. *T. c.* pp. 160-165.
4 new species.

— (5) Landschnecken aus Lykien. *T. c.* pp. 182 & 183.
1 new species.

— (6) Landschnecken von Sinai. *T. c.* pp. 200 & 201.
1 new species.

— (7) Eine ausgestorbene Landschnecke von den Bermuda Inseln. *T. c.* pp. 201 & 202.

Helix nelsoni.

— (8) Ueber Süd-Arabische Landschnecken. *Nachr. mal. Ges.* 1889, pp. 145-153.

With 3 new species.

— (9) Eine neue Damara-Schnecke. *T. c.* pp. 154 & 155.

MARTIN, K. (1) Ueber das Vorkommen einer *Rudisten* führenden Kreide Formation im Südöstlichen Borneo. *Samm. Geol. Mus. Leid.* iv, pp. 117-125, pls. xiii & xiv.

On a *Radiolites* and *Sphaerulites* from Borneo.

— (2) Die Fauna der Kreide-formation von Martapœra. *T. c.* pp. 126-196, pls. xv-xxi.

General account of the beds, with tables of fossils, and special descriptions of 22 new species.

— (3) Versteinerungen der sogenannten alten schieferformation von West-Borneo. *T. c.* pp. 198-207, pls. xxii & xxiii.

With 3 new species.

— (4) Untersuchungen über den Bau von *Orbitolina* (*Patellina*, Auct.) von Borneo. *T. c.* pp. 209-231, pls. xxiv & xxv.

Account of structure of shell with thin sections.

[MARTIN, K.] (5) Ein neues *Telescopium* und die Beziehung dieser Gattung zu *Nerinea*. *T. c.* pp. 232-237, pl. xxvi.

MARTINI, —, & CHEMNITZ, —. Systematisches Conchylien-Cabinet. Vol. viii, Abstr. 5, *Chama*, von CLESSIN, pts. 370 & 372, pls. xi-xvi & xvii-xx. Nürnberg: 1889. *Solenaceæ*, von CLESSIN, pt. 369, pp. 97-106. Nürnberg: 1889. Completes this family; index and description of the plates given. VIII. Abt. 4, *Elatobranchien* von KÜSTER & KOBELT, pp. 133-156, pt. 372, pls. xxxv & xxxvi, von KOBELT. Nürnberg: 1889. VIII. Abstr. 2. *Arcacea*, pts. 368, 371, & 373, pp. 57-136, pls. xvii-xxxiv, von KOBELT & WEINKAUFF.

MASON, J. E. *Helix virgata* in Lincolnshire. *Naturalist*, 1889, p. 11.

MAYER-EYMAR, C. (1) Description de Coquilles fossiles des Terrains Tertiaires Inférieurs. *J. de Conch.* (3) xxix, pp. 50-58, with part of pls. iii & iv.

With 8 new species.

— (2) Description de Coquilles fossiles des Terrains Tertiaires Supérieurs. *T. c.* pp. 58-63, with part of pls. iii & iv.

With 3 new species.

— (3) Description des Coquilles fossiles des Terrains Tertiaires Supérieurs. *T. c.* pp. 200-208, pl. v.

With 8 new species.

— (4) Descriptions de Coquilles fossiles des Terrains Tertiaires Supérieurs. *T. c.* pp. 229-244, pls. x-xii.

With 12 new species.

— (5) Zwölf neue Arten aus dem unteren Londonian des Monte Postale bei Vicenza. *Viert. Ges. Zürich*, xxxiii, pp. 113-119.

12 new species.

MAZZARELLI, G. F. (1) Intorno all' Anatomia dell' Apparato Riproduttore delle *Aplysia* del Golfo di Napoli. *Zool. Anz.* 1889, pp. 330-336, with woodcut. Abstract in *J. R. Micr. Soc.* 1889, p. 628.

A preliminary note.

— (2) Intorno alle Secrezioni della Glandola Opalina (*Vayassière*), e delle Glandole dell' Opercolo branchiale nelle *Aplysia* del Golfo di Napoli. *Zool. Anz.* 1889, pp. 580-583.

— (3) Intorno all' Anatomia e Fisiologia dell' Apparato Riproduttore delle *Aplysia* del Golfo di Napoli. *Boll. Soc. Nat. Napoli*, iii, pp. 120-128, with woodcut.

Contribution to the anatomy and physiology of the reproductive organs in *Aplysia*.

MAZZARELLI & ZUCCARDI. Su di alcune *Aplysida* dell' Oceano Pacifico appartenenti alla collezione Chierchia. *T. c.* pp. 47-54.

On *Dolabella* and *Aplysia*, with 1 new *Aplysia*.

1889. [VOL. XXVI.]

MCALPINE, —. Movements of Bivalve *Mollusca*. J. R. Micr. Soc. 1889, pp. 739 & 740.

Abstract of paper in Zool. Rec. for 1888.

MCCOXY, F. *Sepia apama* (Gray). The large Melbourne Cuttlefish. Prodr. Zool. Vict. Dec., xix pls., 1888-90.

McMURTRIE, J. (1) The Land and Freshwater Shells of the Neighbourhood of N. Berwick, Haddingtonshire. J. of Conch. vi, pp. 1-5.

— (2) Land and Freshwater Shells of the Coast of North Northumberland, from Alnmouth to the Tweed. T. c. pp. 106-109.

MELVILL, J. C. Descriptions of 3 New Species of Shells. T. c. pp. 31-33, pl. ii.

MÉGNIN, M. Le Parasite de la Limace des Caves. *Ereynetes limaceum*. J. de l'Anat. Phys. xxv, pp. 570-572, with woodcuts.

The parasites are commensal.

MENDTHAL, M. Untersuchungen über die Mollusken und Anneliden des Frisches Haffs. Schr. Ges. Königsb. xxx, pp. 27-42.

List of Molluscs from brackish water, with discussion of the derivation of the fauna from fresh water.

MÉNÉGAUX, A. (1) De la Turgescence chez les Lamellibranches. C.R. 1889, i, pp. 361-364. Abstract in J. R. Micr. Soc. 1889, p. 375.

All Bivalves with a well-developed foot have the orifice provided with a sphincter; it is absent in the others. It is not necessary to suppose the taking in of water to explain the turgescence. A post-ventricular muscular dilatation assists the heart to propel the blood in the siphons, and two valves prevent reflux during contraction of the siphons.

— (2) Sur les Homologies de Différents Organes du Taret. C.R. 1889, i, pp. 537 & 538. Abstract in J. R. Micr. Soc. 1889, p. 498.

There is a small anterior adductor, and a larger posterior. *Teredo* is a Dimyarian. Circulatory system is asymmetrical, but resembles condition in *Pholas*.

— (3) Histoire du Taret. Le Nat. 1889, pp. 277-280, woodcut.

A popular account of *Teredo*.

— (4) Contribution à l'Étude de la Turgescence chez les Bivalves siphonnés et asiphonnés. Bull. Soc. Z. Fr. xiv, pp. 40-45.

— (5) Sur les Homologies de Différents Organes des Tarets. T. c. pp. 53-55.

— (6) Sur les Appareils Circulatoires et Respiratoires du *Pecten jacobaeus* et du *P. maximus*. Bull. Soc. Philom. 8th ser., vol. i, pp. 96-105, with a woodcut.

— (7) Sur les rapports de l'Appareil Circulatoire avec le Tube Digestive chez les Animaux du genre *Ostrea*. T. c. pp. 121-126, woodcuts.

Characters peculiar to genus *Ostrea* are described in the gills and circulatory system.

[MÉNÉGAUX, A.] (8) De la Turgescence et de la Branchie dans les Lucines. *T. c.* pp. 130-133, woodcuts.

— (9) Sur la Cœur et la Branchie de la *Nucula nucleus*. *T. c.* pp. 133-135, woodcuts.

— (10) Sur la Branchie des Lamellibranches et sur la comparaison avec celle des Scutibranches. *T. c.* pp. 137-144.

With a table of the relations of the Lamellibranch families in this respect.

MEYER, O. On Miocene Invertebrates from Virginia. *P. Am. Phil. Soc.* xxv, pp. 135-144, 1 pl.

Lists of Molluscs and 6 new species.

MÖLLENDORFF, O. F. VON. Beiträge zur Mollusken-fauna der Philip-pinen. *Nachr. mal. Ges.* 1889, pp. 97-110.

1 new *Cyclophorus*.

MUNCKTON, H. W. Zoological Report on Land and Freshwater Shells round Wellington College. *Rep. Wellington Soc.* 1888, pp. 52 & 53.

MONTEROSATO, D. (1) Molluschi del Porto di Palermo. *Bull. Soc. mal. Ital.* xiv, pp. 75-81.

Continuation.

— (2) Nota intorno ai *Donax* del Mediterraneo. *Nat. Sicil.* viii, pp. 95-98.

List of species, with habitat.

MONTESERATO, M. LE M. DE. (1) Coquilles marines Marocaines. *J. de Conch.* (3) xxix, pp. 20-40.

— (2) Coquilles marines Marocaines. *T. c.* pp. 112-121.

With 4 new species.

MORE, A. G. *Limnaea involuta*, probably a variety of *L. peregra*. *Zool.* 1889, pp. 154 & 155.

After several generations had been bred in captivity, the involute spire disappeared. It is suggested that isolation in a mountain tarn first changed *L. peregra* into *L. involuta*.

MOREELS, L. Note sur *Conularia destinezi* Ptéropode nouveau du Houiller Inférieur (phtanites) d'Argenteau. *Ann. Soc. géol. Belg.* xv, pp. cxviii-cxx, with pl.

MORLET, L. Catalogue des Coquilles recueillies par M. Pavie dans le Cambodge et le Royaume de Siam et description d'Espèces Nouvelles. *J. de Conch.* (3) xxix, pp. 121-200, pls. vi-ix.

With 18 new species.

MORELET, A. (1) Coquilles Nouvelles de l'Afrique Méridionale. *T. c.* pp. 5-20, pls. i & ii.

With 16 new species.

— (2) Note additionnelle sur la Distribution Géographique du *Stenogyra octona*. *T. c.* pp. 363 & 364.

NEUMAYR, M. Ueber die Herkunft der Unioniden. SB. Ak. Wien, Abth. 1, xcvi, pp. 5-26, 3 pls. Abstract in J. R. Micr. Soc. 1889, p. 498; also in Ann. N. H. 1889, i, p. 372.

NEWELL, F. H. Niagara Cephalopods from Northern Indiana. P. Bost. Soc. xxiii, pp. 466-486, with several woodcuts.
7 new species.

NEWTON, R. B. Appendix on the Fossils. Appendix to Baron's Notes on the Geology of Madagascar. Q. J. Geol. Soc. xlv, pp. 331-338, pl. xiv.

Tertiary: Internal casts of *Gasteropoda* and *Pelecypoda*. Cretaceous: 5 *Cephalopoda*; with description and two figures of *Belemnites polygonalis*; 5 *Pelecypoda*, with figure of *Alectryonia* (*Ostrea*) *ungulata*. Jurassic: 5 *Cephalopods*, with description and two figures of *Stephonoceras* (*Ammonites*) *herveyi*; 6 *Gasteropoda*, with figure and description of *Nerita bulignieri*; 15 *Pelecypoda*, with description and figures of *Astarte* (?) *baroni*, n. sp., and description and figures of *Sphæra madagascariensis*, n. sp.

NOBRE, A. Remarques sur la Faune Malacologique marine des Possessions Portugaises de l'Afrique occidentale. J. Sci. Lisb. No. xlv, pp. 107-120.

Faunal list: no new species.

PACKARD, A. S. The Cave Fauna of N. America, with Remarks on the Anatomy of the Brain, and Origin of the Blind Species. Mem. Nat. Ac. Sci. iv, pp. 3-156, 27 pls.

Mollusca were not specially observed; there were no obvious changes in their structure.

PAETEL, FR. Catalog der Conchylien-Sammlung von Fr. Paetel. Lief. 9 & 10. Berlin: 1888 & 1889.

PANTANELLI, O. Pleurotomidi del Miocene Superiore di Montegibbio. Bull. Soc. mal. Ital. xiv, pp. 82-98.
3 new species.

PÉREZ, J. Sur la Descente des Ovules dans le Canal de la Glande Hermaphrodite chez les Hélices. C.R. 1889, i, pp. 365-367. Abstract in J. R. Micr. Soc. 1889, p. 497.

Soon after copulation, the spermatozoa in the efferent duct, as well as the epithelium of the duct, degenerate and become absorbed, leaving the passage free for the ova; actual descent of the ova was not observed.

PEARCE, S. S. On the Varieties of our banded Snails, especially those of *Helix caporata*. J. of Conch. vi, pp. 123-135.

PELSENER, P. (1) Abstract of paper on arms of *Cephalopoda* in Am. Nat. 1889, p. 643.

——. (2) Anatomy of Deep-Sea *Mollusca*. Q. J. Micr. Soc. 1889, p. 369.
Short abstract of 'Challenger' report results.

- [PELSENEER, P.] (3) L'Innervation de l'Osphradium des Mollusques. C.R. 1889, ii, pp. 534 & 535. Abstract in J. R. Micr. Soc. 1889, p. 733.

Osphradium is always in connection with one of the visceral ganglia.

- (4) Sur la Valeur Morphologique des Sacs à Crochets des "Ptéropodes" Gymnosomes. Zool. Anz. 1889, pp. 312-314. Abstract in J. R. Micr. Soc. 1889, p. 496.

The spinous sacs cannot be homologised with any part of the arms of Cephalopods.

- (5) Sur la Position Systématique de *Desmopterus papili*, Chun. Zool. Anz. 1889, pp. 525 & 526. Abstract in J. R. Micr. Soc. 1889, p. 731.

It belongs to the *Thecosomata*, fam. *Cymbuliidae*.

- (6) Sur la Classification des Gastropodes d'après le Système Nerveux. Ann. Soc. mal. Belg. xxiii, pp. xl-xlii.

- (7) Sur le Pied et la Position Systématique des Ptéropodes. T. c. pp. 344-350, with woodcuts and a phylogenetic table.

- (8) Les Lamellibranchies sans Branchies. Bull. Soc. Z. Fr. xiv, pp. 111 & 112.

- PERRIER, R. Recherches sur l'Anatomie et l'Histologie du Rein des Gastéropodes *Prosobranchiata*. Ann. Sci. Nat. viii, pp. 61-192, 4 pls.

Memoir is not yet completed.

- PEYSTER, GEN. DE. On *Anodonta fluviatilis*. Naut. iii, pp. 67-69.

On the adaptability of *Anodon* for spreading.

- PFEFFER, G. Uebersicht der von Herrn F. Stuhlmann in Ägypten, auf Sansibar u. dem gegenüberliegenden Festlande gesammelten Reptilien, Fische, Mollusken u. Krebse. JB. Hamb. vi, pp. 1-36.

- , & KOBELT, —. Bericht neber die wissenschaftlichen Leistungen im Gebiete der Malakologie während des Jahres 1886. Arch. f. Nat. 1887, ii, pp. 345-450, published Aug. 1889.

List of papers and abstracts ; geographical distribution, embryology, &c.

- PIDGEON, W. R. A Mussel living in the Branchiæ of a Crab. Nature, xxxix, p. 127.

- PILSBRY, H. A. (1) On the Helicoid Land Molluscs of Bermuda. Vide HEILPRIN (1).

- (2) Continuation of Manual of Conchology. Vide TRYON (1).

- (3) Continuation of Manual of Conchology : Second series. Vide TRYON (2).

- (4) A new Californian *Helix*. Naut. iii, pp. 14 & 15, with woodcuts.

H. roperi, n. sp.

- (5) Note on Mr. Ancey's criticism. T. c. pp. 42-44.

- (6) *Helix nemoralis* in Virginia. T. c. pp. 51 & 52.

[PILSBRY, H. A.] (7) Some additions to the United States Snail
T. c. pp. 61-64, 1 pl.

1 new species.

— (8) New and little-known American Molluscs : No. 1.
Philad. 1889, pp. 81-89, pl. iii.

From S. States and Mexico.

— (9) The Radula in Rhipidiglossate Mollusca. *T. c.* pp. 13
Abstract of a lecture.

— (10) Nomenclature and Check-list of N. American land
T. c. pp. 191-210.

Psychopatala, n. g., is proposed, and some other genera are reduced.

— (11) On the Anatomy of *Ærope* and *Zingis*. *T. c.* pp.
pl. ix.

Radula and soft parts.

POLLONERA, C. (1) Nuove contribuzioni allo Studio degli *Arion* e
Atti Acc. Tor. xxiv, pp. 623-640, pl. ix.

Coloured figures of many species ; description of 2 new species.

— (2) Osservazione intorno ad alcune Specie di *Testacella*
Mus. Zool. Anat. Comp. Torino, iv, No. 57, 1 pl.

— (3) Nuove aggiunte e correzione alla Malacologia Terre
Piemonte. *Op. cit.* No. 58.

Faunal list, with a new *Helix* ; 2 new *Arion*.

— (4) Elenco dei Molluschi fluviatili viventi in Piemonte.
No. 72.

With 4 new species.

— (5) Note Malacologiche. iv. Un nuovo *Zospeum* italiano
Soc. mal. Ital. xiv, pp. 49 & 50. v. Acme Italiane del gruppo
costulata; *id.* pp. 50-54. vi. *Vitrina stabilei* e *V. nana*,
pp. 54-58. vii. La *Xerophila submaritima*; *id.* pp. 58-64, p.
3 new species.

QUILTER, H. E. Ammonites. *Wesley Nat.* iii, pp. 78-80 &
with woodcuts.

A popular account.

REIBSCH, TH. *Helicophanta* near Dresden. *SB. Ges. Isis*, 1889

REMELE, A. Ueber einige Glossophoren aus Untersilur-Geschichte
Nord-deutschen Diluviums. *Z. Geol. Ges.* xl, pp. 666-670, pl.
Eccyliopterus, n. g. & subg., and 2 new species.

RIVIERE, E. (1) Zoologie. *Rev. Sci.* xvii, p. 474.

A note on the burrowing into limestone of the edible Snail.

— (2) Abstract of Saint-Loup, Observations anatomiques
Aplysien. *T. c.* p. 56.

— (3) Abstract of Robert, De l'hermaphroditisme des *A.*
T. c. p. 185.

[RIVIÈRE, E.] (4) Abstract of Ménégau, De la turgescence des Lamellibranches. *T. c.* pp. 282 & 283.

— (5) Abstract of Westerlund, Sur le faune malacologique extra-marins de l'Europe arctique. *T. c.* p. 813.

ROBERT, E. De l'hermaphroditisme des *Aplysies*. C R. 1889, i, pp. 198–201. Abstract in *J. R. Micr. Soc.* 1889, p. 373.

Hermaphroditism is complete: the differences noted by Saint-Loup are merely differences in age. Sometimes even reciprocal copulation occurs.

ROBERTS, T. The Upper Jurassic Clays of Lincolnshire. *Q. J. Geol. Soc.* xlv, pp. 545–560.

With several lists of *Mollusca*, chiefly Ammonites.

ROBERTS, G. Variation in *Helix nemoralis* and *H. hortensis*, at Rothwell, Yorks. *Naturalist*, 1889, p. 320.

ROULE, L. Études sur le Développement des Annélides et en particulier d'un Oligochæte Limicole Marin. *Ann. Sci. Nat.* vii, pp. 107–442, many woodcuts, 15 pls.

Contains many references to problems of general embryology, and a discussion of the relations and affinities of Trochozoaria descendants.

ROEBUCK, W. D. (1) Slugs, &c., in South Lincolnshire. *Naturalist*, 1889, p. 130.

— (2) Orange-coloured *Arion ater* at Durham. *Limax agrestis* var. *albida* near Preston. *Helix fusca* added to Manx fauna. *T. c.* p. 212.

ROCHEBRUNE, A. T. DE. *Polyplacophora*. Mission Scientifique du Cap Horn, 1882–83, tome vi. *Zoologie*, pp. 131–143, pl. ix.
20 new species.

— & MABILE. Mollusques. *T. c.* pp. 1–129, 8 pls.

Cephalopoda, pp. 5–10, pl. i.; *Enteroctopus*, n. g.; *Martiala*, n. g.; 4 new species. *Gasteropoda*, pp. 10–100, pls. ii–vi; *Microlophus*, n. g.; *Acyrogonia*, n. g.; *Kerguelenia*, n. g.; *Savatieria*, n. g.; 53 new species. *Lamellibranchiata*, pp. 101–126, pls. vii & viii; *Felicia*, n. g.; 23 new species.

ROPER, E. W. Collecting Land Shells in Southern California. *Naut.* iii, pp. 77 & 78.

RYDER, J. A. (1) The Byssus of the young of the Common Clam (*Ulya arenaria*). *Am. Nat.* 1889, pp. 65–67.

The young Clams were found in masses in connection with the Ascidian *Molgula* attached to floating timber. The masses were bound together partly by fibres from the Ascidian, partly by very long byssus threads. In sections the byssus gland was found at the base of the foot.

— (2) Byssus of young of Common Clam. Abstract in *J. R. Micr. Soc.* 1889, p. 375.

[RYDER, J. A.] (3) Notes on the Development of *Ampullaria depressa*, Say. Am. Nat. 1889, pp. 735-737.

Eggs large; central dense and peripheral lighter protoplasm as in Chick. Special air vesicle present at the upper pole of the egg, immediately under the calcareous capsule.

SACCO, F. Aggiunti alla Fauna Malacologica estramarina fossile del Piemonte e della Liguria. Mem. Acc. Tor. xxxix, pp. 61-96, with 2 pls. and tables of the occurrence of the forms.

SAINT-LOUP, R. Sur l'Appareil Reproducteur de l'*Aplysie*. C.R. 1889, i, pp. 364 & 365.

Complete hermaphroditism does not exist. Some individuals function at one time as males, some as females, and others have both genital products simultaneously ripe. All these are equally capable of copulation. The anatomy of the sexual apparatus is described.

SAMPSON, F. A. Description of a new American *Helix*. Naut. iii, pp. 85 & 86, woodcut.

Triodopsis edentata, n. sp.

SAVILLE-KENT, W. Preliminary Observations on a Natural History Collection made on the 'Myrmidon' at Port Darwin and Cambridge Gulf. 1888. P. R. Soc. Queensl. vi, pp. 219-242.

Mollusca, pp. 224-229. Presence and distribution of Oysters. Living *N. pompilius* seen, p. 229. List of *Mollusca*, compiled by C. HEDLEY, pp. 240-242.

SAYN, G. (1) Catalogues de Mollusques Terrestres et Fluviales du Département de la Drome. Bull. Soc. mal. Fr. 1889, pp. 67-81.

Second part. 4 new species of *Lartetia*.

— (2) Note sur quelques Ammonites nouvelles ou peu connues du Néocomien Inférieur. Bull. Soc. géol. xvii, pp. 679-688, pl. xvii.

5 new species.

SCHALFEJEFF, P. Zur Anatomie der *Clione limacina*, Phipps. Zool. Anz. 1889, pp. 188-190. Abstract in J. R. Micr. Soc. 1889, p. 497.

SCHIEMENZ, P. (1) *Mollusca*. Zool. JB. 1888, 66 pp.

List of articles in periodicals and separate publications, pp. 1-7. Abstracts and general accounts, pp. 7-66.

— (2) Parasitische Schnecken. Biol. Centralbl. ix, pp. 567-574 & 585-594, woodcuts.

Account and criticism of Voigt's and Sarasin's memoirs.

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Mollusca, pp. 34 & 35.

SCOTT, T. Notes on a few *Crustacea* and *Mollusca* new to the Fauna of the Forth, with Exhibition of Specimens. P. Phys. Soc. Edinb. x, pp. 154-156.

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Secretion of Sulphuric Acid by Marine Gasteropods. Abstract of above cited memoir in J. R. Micr. Soc. 1889, p. 627. Purpose is to aid Snails in feeding on Starfishes, &c., with hard calcareous skeletons.

SERVAIN, G. Des Différentes Formes Spécifiques du groupe de l'*Helix arbustorum*. Bull. Soc. mal. Fr. 1889, pp. 362-416.

With 4 new species.

SIMONELLI, V. (1) Placunanomie del Pliocene Italiano. Bull. Soc. mal. Ital. xiv, pp. 13-24, pl. i.

An account of various species (1 new) with figures.

— (2) Terreni et Fossili dell' Isola di Pianosa nel Mar Tirreno, with 5 pls. Boll. Com. Geol. 1889, pp. 193-236.

With 3 new species.

SIMPSON, C. T. (1) Genus making. Naut. iii, pp. 5-9.

"Such work (this fever of creating genera and species) simply renders the science of conchology contemptible."

— (2) On a singular case of Imitation in *Ostrea virginica*. T. c. p. 26.

— (3) What is a Species? T. c. pp. 78-80 & 88-90.

SIMROTH, H. (1) Ueber einige *Vaginula*-Arten. Zool. Anz. 1889, pp. 551-556 & 574-578.

3 new species (from Australia) and an account of the anatomy.

— (2) Bemerkung zu H. Semon's Aufsatz ueber die Ausscheidung freier Schwefelsäure bei Meeresschnecken. Biol. Centralbl. ix, p. 287.

— (3) Anhang: Anatomische Notizen zu Nacktschnecken der Gattungen *Lytopelte* und *Parmacella* aus Nord-Persien. Zool. Jahrb. iv, pp. 983-992, pl. xxvii.

Appendix to Böttger's paper (*vide* this Record) giving anatomy of *Parmacella* and *Lytopelte*.

— (4) Beiträge zur Kenntniss der Nacktschnecken. Nachr. mal. Ges. 1889, pp. 177-186, woodcuts.

— (5) Ueber einige Tagesfragen der Malacozologie, hauptsächlich Convergenceserscheinungen betreffend. Z. Naturw. 1889, pp. 65-97.

An essay on convergence, with special reference to the *Mollusca*. He believes (pp. 69 & 70) that under "*Nudibranchiata*" are grouped many convergent forms. So also for the *Testacellidæ* (p. 71). He discusses the influence of the parasitic habit in *Mollusca*. Following Pelseneer's work, he derives the Pteropods from the *Gasteropoda*; but finds that the *Thecosomata* come from *Bulloidea Tectibranchiata*, while the *Gymnosomata* are from *Aplysioidea Tectibranchiata*.

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Ann. N. H. 1889, i, pp. 267-269.

Genus *Melapium* is between *Rapana* and *Coralliophilla*. Synonymy of
Melapium lineatum (Lamarck) and *M. elatum* (Schubert & Wagner).

——. (2) Description of a new genus of Parasitic *Mollusca*. *T. c.* pp.
270 & 271. Abstract in J. R. Micr. Soc. 1889, p. 374.

Robillardia cernica, n. g. & sp., found on an *Echinus* in the Mauritius.

——. (2A) Notes on genus *Lobiger*. *T. c.* pp. 308-311.

With synonymy of species.

——. (3) On the *Mollusca* collected by Mr. G. A. Ramage in the Lesser
Antilles. Report III. *T. c.* pp. 400-405.

A list of the known species, with definition and distribution is given.

——. (4) Diagnoses of new Shells from Lake Tanganyika. *Op. cit.* ii,
pp. 173-175.

All the 5 species of *Neothauma* are varieties of *N. tanganyicense*; 4
species are diagnosed; and *Horea*, n. subg., is created for *Rissoa* (*Horea*)
ponsonbyi.

——. (5) Note on Mr. Williams's Paper on a New Species of *Ampullaria*.
T. c. p. 183.

Mr. Williams is stated to have had no authority to cite Mr. Smith's
support of his 'new' species.

——. (6) On the Land and Freshwater-Shells of the Louisiade Archi-
pelago. *T. c.* pp. 199-209, pl. xiii.

14 terrestrial forms, of which 10 are new and 9 freshwater. A list of
recorded species is given.

——. (7) *Mollusca* from Deep Sea off the S.-W. Coast of Ireland.
T. c. pp. 420-425.

List of forms; a variety of *Buccinum undatum*; a new *Cuspiduria*.

——. (8) Notes on British *Hydrobiae*, with a Description of a supposed
New Species. *J. of Conch.* vi, pp. 142-146.

On *H. jenkinsi*, n. sp.

——. (9) On the Terrestrial Mollusks of Christmas Island. *P. Z. S.*
1888, pp. 536-538.

A list of recorded species and definitions of new species.

SOWERBY, G. B. (1) Descriptions of Fourteen New Species of Shells.
J. L. S. xx, pp. 395-400, pl. xxv.

——. (2) Some further Notes on Marine Shells collected at Port
Elizabeth, S. Africa, with descriptions of some New Species. *J. of*
Conch. vi, pp. 6-15, pl. i.

12 new species figured.

——. (3) Further Notes on Marine Shells of S. Africa, with descriptions
of New Species. *T. c.* p. 147, pl. iii.

9 new species.

- SPURRELL, F. C. J. Estuary of the Thames and its Alluvium. P. Geol. Ass. 1889, pp. 210-230, woodcuts and list of shells.
- STEARNS, R. E. C. (1) Notes on *Physa triticea* of Lea; its relations, and comments on variation, &c., of *Physæ*. Naut. iii, pp. 49-51.
- . (2) Notes and Comments on the distribution of *Planorbis* (*Helisoma*) *bicarinatus*. West Am. Scientist, vi, pp. 110-112.
- . (3) *Helix* (*Stenotrema*) *hirsuta* on the West Coast. Naut. iii, pp. 81 & 82.
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- . (2) Critiques and Comments on Carpenter's Papers. T. c. pp. 64-66.
- STEINMANN, E. Vorläufige Mittheilung über die Organisation der Ammoniten. Ber. Freiberg. Ges. iv, pp. 113-129.
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With *Angustula*, n. subg. of *Vertigo*.
- . (2) *Pupa holzingeri*, n. sp. Naut. iii, pp. 37-39.
- STREMMER, E. Beitrag zur Kenntniss der Tertiären Ablagerungen zwischen Cassel u. Detmold nebst einer Besprechung der Nord-Deutschen *Pecten*-Arten. Z. geol. Ges. xl, pp. 310-354, pls. xx & xxi, and many tables.
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Lists of results of dredging at different places are given, and there are 3 plates of shells, mostly reprints of figures already published.
- STUMP, F. C. Dissection of the Fresh-water Mussel. Tr. Manch. Micr. Soc. 1888, pp. 85 & 86.
Nothing new.
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Putzeysia, n. g.; 7 new species.
- . (2) Comunicazioni Malacologiche. Art. II. T. c. pp. 65-74.
5 new species.
- STER, H. Beiträge zur Schweizerischen Mollusken-Fauna. Mal. Bl. xi, 1, pp. 1-26.
Gasteropoda and *Bivalva*.
- SYKES, E. R. *Vertigo minutissima* (Hartmann) in Dorset. J. of Conch. vi, p. 39.

SZAJNOCHE, W. *Pholadomyocardia Selskii*, n. g. & sp., z. pokładów jurajskich północnej Peruwii. Pam. Akad. umiej. wyd. przyr. Krakau, xvi, pp. 87-92, pl. iv.

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List of *Gasteropoda* begun.

TATE, R. (1) The Gastropods of the Older Tertiary of Australia (1). Tr. R. Soc. S. Austr. x, pp. 91-176, 13 pls.

With 126 new species.

— (2) New Species of Marine *Mollusca* from S. Australia and Victoria. *Op. cit.* xi, pp. 60-66, pl. xi.

Ehippodonta, n. g. (type, *Scintilla lunata*), and 14 new species.

— (3) A Supplement to the List of Lamellibranch and Pallio-branch *Mollusca* of S. Australia. *T. c.* pp. 67-69.

— (4) A Census of the Molluscan Fauna of Australia. *T. c.* pp. 70-81.

A classified list of genera, with the number of species.

— (5) The Gastropods of the Older Tertiary of Australia. Part II. *T. c.* pp. 116-174, 9 pls.

With *Eburnopsis*, n. g. allied to *Fusus*, and 84 new species.

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Abstract of paper quoted in *Zool. Rec.* 1888.

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Part I. *Gasteropoda*, 52 pp. Part II. *Gasteropoda*, 29 pp.

THIELE, J. (1) Die Abdominalen Sinnesorgane der Lamellibranchen. *Z. wiss. Zool.* xlviii, pp. 47-58, pl. iv. Abstract in *J. R. Micr. Soc.* 1889, pp. 374 & 375.

Absent in *Siphonata*, and in *Pecten* and *Ostrea* degenerate on the left side in many forms. They consist of a peculiarly modified epithelium, resembling that on the lateral abdominal organs of the *Capitellidae*. The papillæ are probably also sense organs for estimating water currents.

— (2) Ueber Sinnesorgane der Seitenlinie u. das Nervensystem von Mollusken. *Z. wiss. Zool.* xlix, pp. 385-432, pls. xvi & xvii.

On a series of sense organs found in different *Mollusca*, homologous with the lateral line organs of *Chaetopods*; also on the homologies of the

nervous system. The supra-oesophageal ganglia of Polyclada, Annelids, and Solenogaster are homologous, not with the vertebral ganglia of *Mollusca*, but with the lateral-oesophageal ganglia specially conspicuous in *Neomenia*. There is a strong contrast in relations and histology between the ventral cords and the central ganglia with the lateral line system; and it is the former which corresponds with the spinal cord of *Chordata*.

TOLDO, G. *Mitridæ* del Miocene Superiore di Montigibio (1). Bull. Soc. mal. Ital. xiv, pp. 144-150, pl. iii.

5 new species.

TOULA, F. Geologische Untersuchungen im Centralen Balkan. Denk. Ak. Wien, lv, 108 pp., with maps, woodcuts, and 8 palæontological plates.

Palæontological part, pp. 62-101, with many figures and several new species.

TRINCHESE, S. Descrizione del nuovo genere *Caloria*. Mem. Acc. Bologn. ix, pp. 87-91, 1 pl.

On *Caloria maculata*, n. g. & sp., an *Aeolis*.

TRYON, E. W. (1) Manual of Conchology; Structural and Systematic. Vol. xi. *Trochidæ, Stomatidæ, Pleurotomariidæ, Haliotidæ*, by H. A. PILSBRY. Pt. xli, pp. 1-64, 14 coloured pls.; pt. xlii, pp. 65-128, pls. (coloured) xv-xxxii; pt. xliii, pp. 129-208, pls. (some coloured) xxxiii-xlix; pt. xliv, pp. 209-384; pt. xlv, pp. 385-519, pls. l-lxvii, and index to *Trochidæ* and description of pls. i-lxvii. Philadelphia: 1889, 8vo.

With 9 new species and several new sections of subgenera.

— (2) Manual of Conchology; Structural and Systematic. Second series, *Pulmonata*: continuation by H. A. PILSBRY. Vol. v. (*Helicidæ*, vol. iii). Pt. xvii, pp. 1-64, pls. (coloured) ii-xvi; pt. xviii, pp. 65-128, pls. (coloured) i & xvi to xxiii; pt. xix, pp. 129-176, pls. (coloured) xxiv-xliv; pt. xx, pp. 177-216, pls. (coloured) xlv-lxiv, and index to genera and subgenera, and description of plates in vol. v. Philadelphia: 1889, 8vo.

With 2 new species and 13 new varieties.

VAYSSIÈRE, A. (1) Atlas d'Anatomie Comparée des Invertébrés. Paris: Octave Doin, 1890. Vol. i, text; vol. ii, plates.

Plates i-xv, *Mollusca*, general anatomy.

— (2) Note sur un cas de Monstruosité observé chez un *Mytilus edulis*. J. de Conch. (3), xxix, pp. 213-216, pl. x.

VENYUKOVA, P. Fauna devonskikh otlozhenii okrestnoctei Svinorda (Fauna of the Devonian, near Svenord). Trudui St. Petersburg Nat. (Geolog. division), xx, pp. 1-19, pl. i.

With figures of various species of *Leptodesma*.

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- VIGUIER, M. Etude sur le Pliocène de Montpellier. Bull. Soc. géol. xvii, pp. 379-423, pls. ix & x.
- VINCENT, G. Nouvelle liste de la Faune conchyliologique de l'Argile rupelienne. Ann. Soc. mal. Belg. xxiii, pp. xxxviii-xl.
- WAGNER, R. Ueber einige Cephalopoden aus dem Röth und unteren Muschelkalk von Jena. Z. geol. Ges. xl, pp. 24-38, pls. iii-v.
- WALCOTT, C. D. (1) Description of New Genera and Species of Fossils from the Middle Cambrian. P. U. S. Nat. Mus. xi, pp. 441-446.
With 2 new species.
- . (2) Stratigraphic Position of the Olenellus Fauna in N. America and Europe. Am. J. Sci. xxxvii, pp. 374-392, and xxxviii, pp. 23-42.
Includes lists of fauna in Olenellus beds in Europe and America, compiled from the various publications of the author. Among *Lamelli-branchiata*, *Fordilla* and *Modioloides prisca* appear in the Olenellus beds, and not again till the Arenig of S. Wales.
- WALKER, B. On the occurrence of *Unio complanatus* in Michigan. Naut. iii, pp. 16 & 17.
- WATASE, S. On a New Phenomenon of Cleavage in the Ovum of the Cephalopod. Johns Hopk. Univ. Circ. 1889, pp. 33 & 34, with woodcut. Abstract in J. R. Micr. Soc. 1889, p. 734.
Ovum is bilaterally symmetrical. Subsequent cleavage intensifies this symmetry. First furrow coincides with the median axis of the animal; second is at right angles to this. Segmentation is more active in the anterior than in the posterior half of the blastoderm, and the right and left halves are alternately active and passive.
- WATTEBLÉ, G. Catalogue des Mollusques Terrestres et Fluviales observés aux environs d'Auxerre (Côte d'Or). J. de Conch. (3) xxix, pp. 306-362.
- WEBSTER, C. L. Devonian Rocks of Iowa. Am. Nat. 1889, pp. 221-243.
With lists of shells, &c.
- WESTERLUND, C. A. Fauna der in der Palæarktischen Region lebenden Binnenconchylien. II. Genus *Helix*. Berlin: 1889, Friedländer.
473 pages and index.
- WHITE, C. A. The North American Mesozoic. Science, xiv, pp. 164-166.
A popular account. Contains numerous references to *Mollusca*.
- WHITEAVES, G. F. Contributions to Canadian Palæontology. Vol. i. part ii, with plates. Montreal: 1889.
Mollusca from Hamilton Formation of Ontario, pp. 116-119, with 1 new species. List, pp. 124 & 125. Fossils from the Triassic of British Columbia: *Mollusca*, pp. 131-149; *Amniotites*, n. g., and 4 new species. Lower Cretaceous of Columbia, &c.: *Mollusca*, pp. 151-190, with 2 new species.

WHITFIELD, R. P. Observations on some imperfectly known fossils from the Calcareous Sandrock of Lake Champlain, and descriptions of several new forms. Bull. Am. Mus. Nat. Hist. ii, pp. 41-63, pls. vii-x.

With 11 new species.

WILLIAMS, J. W. (1) Variation in the *Mollusca* and its probable cause. Sci. Goss 1889, pp. 146, 147, 174-176, & 200-203 (with woodcuts), and pp. 245-248.

On the general problems of variation, specially applied to the *Mollusca*.

— (2) *Limnæa involuta* probably a variety of *L. peregra*. Zool. 1889, pp. 235 & 236.

Criticizes the view of More (*suprà*, in this Record).

— (3) *Mollusca* in the Neighbourhood of London. T. c. pp. 236 & 237.

— (4) The Basal Colouration of the Shells of *Helix hortensis* and *H. nemoralis*. T. c. p. 272.

— (5) *Mollusca* of Stourport and District. T. c. pp. 353 & 354.

— (6) A Tumour in the Freshwater Mussel. J. Anat. Phys. xxiv, pp. 306 & 307.

On the left pallial lobe, formed of connective tissue proliferation.

— (7) Note on a new Species of *Ampullaria* from the La Plata. Ann. N. H. 1889, ii, pp. 47-49.

Ampullaria georgii, n. sp.

— (8) Descriptions of two new Varieties of British Shells: *Helix hispida* var. *elerata*, and *Limnæa peregra* var. *convoluta*. Mid. Nat. 1889, p. 193.

— (9) Two hitherto undescribed Varieties of *Limnæa stagnalis* (Linn.). T. c. pp. 164 & 165.

L. stagnalis var. *elegans*, and *L. stagnalis* var. *contortula*.

— (10) On the circumstances attending the death, by drowning, of *Helix aspersa*. J. of Conch. vi, pp. 16 & 17.

— (11) On the meaning of the Glycogenic Function in the *Mollusca*. T. c. pp. 34-39.

— (12) Preliminary Notes on the phenomena of Muscle Contraction in the *Mollusca*. T. c. pp. 46-52.

— (13) Contributions towards a Future Knowledge of Worcestershire *Mollusca*. T. c. pp. 111-114.

— (14) Fluid emitted by *Limnæa stagnalis*. T. c. pp. 122 & 123.

Contains hæmocyanin.

WILSON, —, & CRICK, —. (1) The Lias Marlstone of Tilton. Geol. Mag. 1889, pp. 296-305.

— & —. (2) The Lias Marlstone of Tilton, Leicestershire. T. c. pp. 337-342, pl. x.

With list of fossils and a new *Pinna*.

WÖHRMANN, S. F. VON. Die Fauna der sogenannten Cardita u Raibler-Schichten in den Nordtiroler u. bayerischen Alpen. JB. geol. Reichsanst. 1889, xxxix, p. 181, 6 pls.

With 4 new genera: *Astartopsis*, *Gruenewaldia*, *Myophoricardium*, *Myophoriopsis*, and 15 new species.

WRIGHT, B. H. A new Florida *Bulimulus*. West. Am. Scientist, vi, p. 8.

YOUNG, M. *Testacella haliotidea* (var. *scutulum*) in Renfrewshire. Zool. 1889, p. 236.

ZYKOFF, W. Bemerkung über fadenspinnende Schnecken. Zool. Anz. 1889, p. 584.

Confirms, in *Arion empiricorum*, the spinning of a thread noticed by Eimer in *Limax*.

III.—REFERENCES. SYSTEMATIC CLASSIFICATION.

GENERAL.

Review for 1886; PFEFFER & KOBELT.

Summary for 1888; SCHIEMENZ (1).

Text-book; ECKSTEIN.

Mythology; STRICKER.

Economic *Mollusca* of Acadia; GANONG (2).

Osphradium: innervation; PELSENEER (3).

Amœboid cells: CATTANEO.

CEPHALOPODA.

Review of British Museum Catalogue; ANON (2).

Forms from Madagascar Cretaceous; NEWTON. Forms from Madagascar Jurassic; *id.*

Silurian *Cephalopoda*: shell structure; DEWITZ.

Cephalopoda: lymphatic gland; CUÉNOT. Nerve supply of arms; JATTA (2).

DIBRANCHIATA.

OCTOPODA.

Octopus chierchiae, n. sp.; JATTA (1). *O. chromatus*, n. sp., with fig.; HELPRIN (1). *O. hyadesi*, n. sp., with figs.; ROCHEBRUNE & MABILE. *O. pantherinus*, n. sp., with fig.: *id.*

Enteroctopus, n. g., *E. megalocypthus*, n. sp.; *id.*

Argonauta: relation to *Ammonites*; STEINMANN.

DECAPODA.

- Martialis*, n. g., *M. hyadesi*, n. sp., with fig.; ROCHEBRUNE & MARILE.
Spirulirostra bellardii: description, with fig.; BENOIST.
Gonatidae, n. subfam.; HOYLE (1).
Gonatus fabricii: anatomy and relations; *id.*
Enoploteuthis: relations to *Gonatus*; *id.*
Onychoteuthis: relations to *Gonatus*; *id.*
Sepiola; GIARD.
Loligo: development; WATASE.
Sepia: modified epithelium in embryo; HOYLE (2). *S. apama*, with figs.; MCCOY. *S. isseli*, with figs.; ISSEL. *Sepia*: various species; shell, sex, and specific characters; LAGATU. *S. veranyi*, n. sp., with figs.; *id.*

DECAPODA-PHRAGMOPHORA.

- Belemnites polygonalis*, with figs.; NEWTON.
Belemnitella mantibensis, n. sp., with fig.; WHITEAVES.

AMMONEA.

- Ammonites*; HOLZAPFEL (2).
 Jurassic *Ammonites*; BUCKMAN (3).
 Popular account of *Ammonites*; QUILTER.
 Organization of *Ammonites*; STEINMANN.
 Abstract of Steinmann's works; SIMROTH (6).
Aptychus radiatus, n. sp., with fig.; FRIČ.

PROSIPHONATA.

CLYDONITIDÆ.

- Buliotites carlottensis*, n. sp., with fig.; WHITEAVES.

PINNACOCERATIDÆ.

- Medlicottinae*, *Neritinae*, and *Lecanitinae*: relations; pp. 41-45; KARPINSKY.
Parapronorites latus, n. sp., with fig.; *P. mojsisovicsi*, n. sp., with fig.; *P. tenuis*, n. sp., with fig.; *id.*
Pronorites cyclobolus, n. var. *uralensis*, with figs.; *id.*
Propinoceras darwasi, n. sp., with fig.; *id.*

CERATITIDÆ.

- Ceratites*, with fig.; JÄKEL.
Ceratites, n. f. indet., with fig.; WAGNER.
Archochordiceras carlottense, n. sp., with fig.; WHITEAVES.
 1889. [VOL. XXVI.]

Arnniotites, Hyatt, n. g. = *Balatonites arietiformis*, Mojsisovics ;
 WHITEAVES. *A. vancouverensis*, with fig. ; *id.*
Trachyceras canadense, n. sp., with figs. ; *id.*

AMALTHEIDÆ.

Amaltheus: relations ; BUCKMAN (1). *A. margaritatus*, with figs. ;
id. (1).

Erycites fallax, with fig. of suture ; *id.* (1).

Haugia, var. species, with figs. of suture ; *id.* (1).

Placenticeras occidentale, with fig. ; *P. liardense*, with fig. ; WHITEAVES.

P. glabrum, n. sp., with fig. ; *id.*

Pleuroceras, var. species, with figs. of suture ; BUCKMAN (1).

Schloenbachia borealis, n. sp., with fig. ; *S. gracilis*, n. sp., with fig. ;
 WHITEAVES.

Sonninia, descent of ; *S. acanthodes*, n. sp., with figs. ; *S. corrugata*, with
 fig. ; *S. subtrigonata*, n. sp., with fig. ; BUCKMAN (1).

Witchellia: figs. of suture ; *id.* (1).

AMMONITIDÆ.

Ammonites, sp. indet., with fig. ; MARTIN (2). *A. deverioides*, n. sp.,
 with figs. ; GROSSOUVRE.

HARPOCERATIDÆ AND HILDOCERATIDÆ.

Beneckeia tenuis, with figs. ; *B. buchi*, with figs. ; WAGNER.

Hammatoceras amplexans, n. sp. ; BUCKMAN (1). *H. insigne* and *H.*
planinsigne, with figs. of suture ; *id.* (1). *H. dolium*, n. sp., with fig. ;
id. (1).

Hildoceratidæ: table of distribution ; *id.* (1).

Hyperlioceras, n. g. ; *H. walkeri*, n. sp., with fig. ; *id.* (2). *H. sub-*
discoidum, n. sp., with fig. ; *id.* (2).

Lillia sulcata, n. sp., with fig. ; *id.* (2).

Lioceras apertum, n. sp., with fig. ; *id.* (2). *H. concavum*, n. var. *for-*
mosum, with fig. ; *id.* (2): n. var. *pingue* and n. var. *v-scriptum* ; *id.* (2).
L. fallax, n. sp., with fig. ; *id.* (2).

Ludwigia lucyi, n. sp., with fig. ; *id.* (2). *L. rudis*, n. sp., with fig. ; *id.*
 (2).

Oppelia valfinensis, n. sp., with fig. ; DE LORIOL.

Pæcilomorphus, n. g. ; *P. maver*, n. sp., with fig. ; BUCKMAN (2).

Pseudolioceras, n. g. ; *id.* (2).

STEPHANOCERATIDÆ.

Hamites phalaratus, n. sp., with fig. ; GRIEFENKERL.

Holcodiscus andrussovi, n. sp., with figs. ; KARAKASCH.

Hoplites arnoldi, with figs. ; *H. asperimus*, with figs. ; SAYN (2). *H.*
biassalensis, n. sp., with figs. ; *H. desori*, with figs. ; KARAKASCH. *H.*

grossouvrei, with figs. ; SAYN (2). *H. inostranzeuri*, n. sp., with figs. ; *H. wigzag*, n. sp., with figs. ; KARAKASCH.

Scaphites, with fig. ; MARTIN (2).

Simoceras dicuse, n. sp., with figs. ; SAYN (2).

Stephanoceras herveyi, with fig. ; NEWTON.

RETROSIPHONATA.

Dimorphoceras brancoi, n. sp., with fig. ; HOLZAPFEL (2).

Gastrioceras fedorovi, n. sp., with fig. ; *G. nikitini*, n. sp., with fig. ; *G. suessi*, n. sp., with fig. ; KARPINSKY.

Goniatites intumescens, with fig. ; *G. münsteri*, with fig. ; *G. subsulcatus*, with fig. ; BERGERON.

Glyphioceras barroisi, n. sp., with fig. ; HOLZAPFEL (2). *G. inostranzevi*, n. sp., with fig. ; KARPINSKY. *G. römeri*, n. n., with fig. ; HOLZAPFEL (2).

Nomismoceras spiratissimum, n. sp., with fig. ; *id.* (2).

Paralegoceras tchernyschewi, n. sp., with fig. ; KARPINSKY.

Pericyclus hauchecornei, n. sp., with fig. ; *P. kochi*, n. sp., with fig. ; *P. subglaber*, n. sp., with fig. ; HOLZAPFEL (2).

Popanoceras krasnopolskyi, n. sp., with fig. ; *P. lapuseni*, n. sp., with fig. ; KARPINSKY. *P. mcconnelli*, n. sp., with fig. ; WHITEAVES. *P. romanosovsky*, n. sp., with fig. ; KARPINSKY.

AMMONEA, not classified.

Aguthiceras krotowi, n. sp., with fig. ; *A. stuckenbergi*, n. sp., with fig. ; KARPINSKY.

Holcostephanus bachelardi, n. sp., with fig. ; *H. chaignoni*, n. sp., with fig. ; *H. bigutti*, n. sp., with fig. ; SAYN (2).

Thalassoceras gemmellaroi, n. sp., with fig. ; KARPINSKY.

TETRABRANCHIATA.

RETROSIPHONATA.

Aturia aturi and *A. basteroti*, description, with figs. ; BENOIST.

Celonautilus cariniferus : muscular impressions, with fig. ; FOORD & CRICK.

Nautilus allionii, with figs. ; *N. decipiens*, with figs. ; BENOIST. *N. liardensis*, n. sp., with figs. ; WHITEAVES. *N. pompilius* : siphon and funnel ; BROOKS. *N. restrictus*, n. sp., with figs. ; GRIEPENKERL. *N. rhenanus*, n. sp., with figs. ; HOLZAPFEL (2). *N. trichinopolitensis*, with fig. ; MARTIN (2).

Cyrtoceras buckmanensis, n. sp., with fig. ; *C. kirbyi*, n. sp., with fig. ; *C. rui*, n. sp., with fig. ; WHITFIELD.

Gomphoceras angustum, n. sp., with fig. ; *G. linearis*, n. sp., with fig. ; *G. projectum*, n. sp., with fig. ; *G. wabashensis*, n. sp., with fig. ; NEWELL.

Hezamoceras cacabiiformis, n. sp., with fig. ; *H. delphicolum*, n. sp., with fig. ; *id.*

Orthoceras obstructum, n. sp., with fig. ; *id.* *O. pulchrum*, with fig. : *pseudocalamiteum*, with fig. ; BARROIS (1).

Orthoceras subg. *Jovelliana* ; *J. davyi*, n. sp., with fig. ; *J. kochi*, with fig. ; *id.* (1).

Asoceras ; BLAKE. *A. indianensis*, n. sp., with figs. ; NEWELL. *murchisoni* : deciduous septa ; FOORD.

PTEROPODA.

Relation to Gasteropods ; SIMROTH (5).

Foot and systematic position ; PELSENEER (7).

Forms from Olenellus beds ; WALCOTT (2).

GYMNOSOMATA.

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Clione limacina : anatomy ; SCHALFEJEFF.

THECOSOMATA.

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Cavolinia aquensis : description, with figs. ; BENOIST.

Cleodora ortheziana : description, with figs. ; *id.*

Criseis moulinsei : description, with figs. ; *id.*

Hyalæa melly ; SULLIOTTI (2). *H. strafforelliana*, n. sp. ; *id.* (1).

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Vaginella calandrellii : description with figs. ; BENOIST. *V. depressa* : description, with figs. ; *id.*

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Hungerfordia, n. g. ; *H. pelewensis*, n. sp., with figs. ; BEDDOME.
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Origin by convergence ; SIMROTH (5).
Aerope knysnaënsis, general anatomy, with figs. ; PILSBRY (11).
Daudebardia rufa var. *cycladum*, with fig. ; VON MARTENS (1).
Ennea mollendorffi, n. sp., with fig. ; *E. morleti*, n. sp., with fig. ;
HIDALGO. *E. candidula*, n. sp., with fig. ; *E. pusilla*, n. sp., with
fig. ; *E. natalensis*, n. sp., with fig. ; *E. zanguebarica*, n. sp., with fig. ;
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Hyalina cypria, var. *major*, with fig. ; *H. nitidissima*, with fig. ; *H.*
superflua, with fig. ; VON MARTENS (1).
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id. (2). *H. patulæformis*, n. sp., with fig. ; *H. (Retinella) persica*, n. sp.,
with fig. ; *H. siaretana*, n. sp., with fig. ; *id.* (9) ; *H. sublenticularis*,
n. sp., with fig. ; *id.* (2).
Limax : commensal Acariens ; MËGNIN.
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M. indefinita, n. sp.; ANCEY (11). *M. marici*, n. sp.; *id.* (8). *M. oahuensis*, n. sp.; *M. platyla*, n. sp.; *M. plicosa*, n. sp.; *M. perlaena*, n. sp.; *id.* (11).

Nanina inclinata, with fig.; SMITH (6). *N. plateni*, n. sp.; DOHERN. *N. quadrasi*, n. sp.; HIDALGO. *N. rosseliana*, n. sp., with fig.; SMITH (6).

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Chlorostracia, n. g., allied to *Paludomus*; *C. varians*, sp., with fig. MABLE.

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Livinhacia (gen. allied to *Bulimus*); CROSSE.

Oxychona layardi, n. sp., with fig.; HARTMAN.

Patula glissoni, n. sp.; *P. monstrosa*, n. sp.; ANCEY (2, 3). *P. lyrata*, n. sp.; *P. leptoptera*, n. sp., with fig.; *P. rigophila*, n. sp., with fig.; ROCHEBRUNE & MABILE.

Payenia saxatilis, n. sp.; *id.*

Thersites: anatomy, with figs.; HEDLEY (2).

Triodopsis edentata, n. sp., with fig.; SAMPSON.

Trochomorpha conveza, n. sp., with fig.; HARTMAN. *T. kusana*, n. sp., with figs.; ALDRICH. *T. nigrans*, n. sp., with figs.; SMITH (6). *T. sabaea*, n. sp.; MARTENS (8).

Helix (Xerophila) sinaica, n. sp.; *id.* (6). *H. (X.) millepunctata*, n. sp., with figs.; BÆTTGER (9).

Xerophila. X. sub-maritima, with figs.; POLLONERA (5).

ORTHALICIDÆ.

Orthalicus macandrewi, n. sp., with fig., from Peru; SOWERBY (1).

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Amphidromus entobaptus, n. sp.; DOHRN.

Bulimulus hemphilli, n. sp., from Florida; WRIGHT. *Bulimulus*: a mammoth snail; R. E. C. S. (1).

Charis bicolor, n. sp., with figs.; *C. rossiteri*, n. sp., with figs.; HARTMAN.

PUPIDÆ.

Buliminus cæsius, varieties, with fig.; *B. dryops*, n. sp., with fig.; *B. samius*, n. sp., with fig.; VON MARTENS (1). *B. (Pseudonapæus) herzi*, n. sp., with fig.; *B. walleri*, n. sp., with fig.; BÆTTGER (9).

Clausilia, n. sp.; *id.* (5). *C. adaucta*, n. sp.; GREDLER (1). *C. bazini-ana*, n. sp.; HEUDE (2). *C. cholerigena*, n. sp.; *id.* (1). *C. circinnata*, n. sp.; *id.* (2). *C. comminuta*, n. sp.; *id.* *C. diaconalis*, n. sp.; *id.* (1). *C. dohertyi*, n. sp., with figs.; ALDRICH.

Nenia (Clausilia) flachi, n. sp.; BÆTTGER (7).

Clausilia lepidospira, n. sp.; HEUDE (1). *C. luschanii*, n. sp.; MARTENS (5). *C. psilodonta*, n. sp.; *C. ruptica*, n. sp.; *C. rustica*, n. sp.; *C. scholastica*, n. sp.; HEUDE (1). *C. schweinfurthi*, n. sp.; MARTENS (8).

Holospira elizabethæ, n. sp., with figs.; PILSBRY (8).

Pupa: time and space changes in the species; BETTGER (11). *P. calamitosa*, n. sp., with fig.; PILSBRY (7). *P. diecki*, n. sp.; GREDLER (1). *P. (faula) ponsonbyana*, n. sp., with fig.; MORELET (1). *P. holyingeri*, n. sp.; STERKI (2). *P. (Sphyradium) spinellii*, n. sp.; GREDLER (2).

Acnospupa, n. g.; BETTGER (11).

Enneopupa, n. g.; *id.* (11).

Negulus, n. g.; *N. lineolatus*, with figs.; *id.* (11).

Ptychulæa, n. g.; *id.* (11).

Pupilla eumeces, n. sp., with fig.; *P. cupella*, n. sp., with fig.; *P. quadrigranata*, variations, with figs.; *id.* (11).

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Vertigo alrea kochi, n. sp., with fig.; *V. comes*, n. sp.; *V. eishaimensis*, n. sp., with fig.; *V. ovatula*, with fig.; *V. protracta*, with fig.; *id.* (11).

Angustula, n. subg. of *Vertigo*; STERKI (1).

Zospeum tellinii, n. sp., with fig.; POLLONERA (5).

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Achatina crawfordi, n. sp., with fig.; MORELET (1). *A. schencki*, n. sp.; MARTENS (4).

Stenogyra: species in Antillas; SMITH (3). *S. acuta*, n. sp., with fig.; MORELET (1).

Ferussacia arctica, n. sp.; ANON (1).

HELICTERIDÆ.

Auricuella westerlundiana, n. sp.; *A. umbilicata*, n. sp.; *A. tenella*, n. sp.; ANCEY (11).

Leptachatina columna, n. sp.; *id.* (9).

Tornatellinus baldwini, n. sp.; *T. euryomphala*, n. sp.; *id.* (11).

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Succinea aurulenta, n. sp.; *S. balthoinii*, n. sp.; *S. cinnamomea*, n. sp.; *S. delicata*, n. sp.; ANCEY (11). *S. listeri*, n. sp.; SMITH (9). *S. lutulenta*, n. sp.; *S. mauiensis*, n. sp.; ANCEY (11).

ATHORACOPHORIDÆ.

Aneitea græffii: anatomy and synonymy; HEDLEY (1).

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Vaginula hedleyi, n. sp.; *V. hennigi*, n. sp.; *V. leydigi*, n. sp.; SIMMONS (1).

ONCHIDIIDÆ.

Onchidium (Onchidiella) transatlanticum, n. sp., with fig.; HEILPRIN (1).

AURICULIDÆ.

Alexia acuminata, n. sp., with fig. ; *A. pulchella*, n. sp., with fig. ; MORELET (1).

Auricula conica, n. sp., with fig. ; *A. grandis*, n. sp., with fig. ; *A. perforata*, n. sp., with fig. ; *A. vicina*, n. sp., with fig. ; *A. longa*, n. sp., with fig. ; *A. parva*, n. sp., with fig. ; BRIART & CORNET.

Blauneria acuta, n. sp., with fig. ; *B. cylindrata*, n. sp., with fig. ; *B. ovata*, n. sp., with fig. ; *iid.*

Carychium munieri, n. sp., with fig. ; *iid.*

Melampus cochleatus, n. sp., with fig. ; *M. olivæformis*, n. sp., with fig. ; *iid.*

Plecotrema minuta, n. sp., with fig. ; *P. ovalis*, n. sp., with fig. ; *P. turbiniformis*, n. sp., with fig. ; *P. conica*, n. sp., with fig. ; *iid.*

Pythia globosa, n. sp., with fig. ; *P. distensus*, n. sp., with fig. ; *P. pisaria*, n. sp., with fig. ; *iid.*

Alexia elongata, n. sp., with fig. ; *A. fusiformis*, n. sp., with fig. ; *iid.*

LIMNÆIDÆ.

Acyrogonia, n. g. ; *A. fusca*, n. sp. ; *A. nervosa*, n. sp. ; ROCHEBRUNE & MABILE.

Bulinus : definition of genus ; COOKE (1).

Limnæa alpina, n. sp. ; POLLONERA (4). *L. aulacospira*, n. sp. ; ANCEY (10). *L. cottiana*, n. sp. ; POLLONERA (4). *L. hannonica*, n. sp., with fig. ; BRIART & CORNET. *L. involuta*, a variety of *L. peregra* ; "pro," MORE ; "contra," WILLIAMS (2). *L. peregra*, n. var. *convoluta* ; WILLIAMS (8). *L. stagnalis* : fluid emitted ; *id.* (14). *L. stagnalis*, n. var. *elegans*, *id.* n. var. *contortula* ; *id.* (9).

Planorbis bicarinatus : distribution ; STEARNS (2).

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Physæ of Australia really *Limnæide* ; COOKE (1).

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THALASSOPHILA.

Kerguelenia, n. g. ; *K. redemiculum*, n. sp. ; *K. macgillivrayi*, n. sp. ; ROCHEBRUNE & MABILE.

Siphonaria dubia, n. sp., with fig. ; BRIART & CORNET.

OPISTHOBRANCHIATA.

NUDIBRANCHIATA.

List of Plymouth forms ; GARSTANG.

Origin of group by convergence ; SIMROTH (5).

Suggested division into *Mesommatophora* (with eyes on tip of tentacle) and *Pleurommatophora* (with eyes at sides of tentacles), p. 69 ; *id.* (5).

DORIOPSIDÆ.

Doriopsis: *D. nigra*, var. *nigerrima*, Bergh ; *D. pudibunda*, *D. tuberculosa*, with figs. ; BERGH (2).

DORIDIDÆ.

Chromodoris: *C. porcata*, n. sp., with figs. ; *C. rosans*, n. sp., with figs. ; *C. carnea*, n. sp., with figs. ; BERGH (2). *C. sebra*, n. sp., with fig. ; HEILPRIN (1).

Carminodoris, n. g. ; *C. mauritiana*, n. sp., with figs. ; BERGH (2).

Cassella: *C. cincta*, n. sp., with figs. ; *id.*

Hulgerda: *H. formosa*, with figs. ; *id.*

Hexabranchus, list of species ; *H. marginatus*, with figs. ; *id.*

Pellodoris: *P. mauritiana*, n. sp., with fig. ; *id.*

POLYCERIDÆ.

Acanthodoris vatheleti, n. sp. ; ROCHEBRUNE & MABILE.

Trevelyana: *T. (Rhodigina) crocea*, n. sp., with figs. ; BERGH (2).

PHYLLIDIADÆ.

Fryeria rüppellii, with figs. ; BERGH (2).

Phyllidiopsis striata, n. sp., with figs. ; *id.*

Phyllidiadæ: conspectus of family ; *id.*

Phyllidiella: *P. nobilis*, with figs. ; *id.*

HYPOBRANCHIÆIDÆ.

Cerambe testudinaria, n. sp., with fig. ; FISCHER (1).

DENDRONOTIDÆ.

Dendronotus arborescens: anatomy, with figs. ; HERDMAN & CHUBB.

Lomanotus varians, n. sp. ; GARSTANG.

ÆOLIDIDÆ.

Æolididæ: genera ; BERGH (1).

Æolis: anatomy, with figs. ; HERDMANN & CHUBB.

Caloria, n. g. ; *C. maculata*, n. sp., with figs. ; TRINCHESE.

TECTIBRANCHIATA.

ACTEONIDÆ.

Actæon basteroti, n. sp., with fig.; *A. burdigalensis*, n. sp., with figs.; *A. cancellatus*, description, with figs.; *A. clavulus*, with figs.; *A. dargelasi*, description, with figs.; *A. degrangei*, n. sp., with figs.; *A. punctulatus*, with figs.; BENOIST. *A. formosus*, n. sp., with fig.; BRIART & CORNET. *A. humboldti*, with figs.; *A. inflatus*, description, with figs.; *A. lavigatus*, description, with figs.; *A. moulinsii*, n. sp., with figs.; *A. neglectus*, n. sp., with figs.; *A. orthezi*, description, with figs.; *A. papyraceus*, with figs.; *A. parvulus*, n. sp., with figs.; *A. paulensis*, n. sp., with fig.; *A. pinguis*, with fig.; *A. salinensis*, n. sp., with fig.; *A. saucatsensis*, n. sp., with figs.; *A. scalariformis*, n. sp., with figs.; *A. semistriatus*, description, with figs.; *A. simulatus*, with figs.; *A. souverbiei*, n. sp., with fig.; *A. striatellus*, with figs.; *A. subglobosus*, description, with figs.; BENOIST. *A. tenuiplicatus*, n. sp., with fig.; BRIART & CORNET. *A. tornatilis*, description, with figs.; BENOIST. *A. valpinensis*, n. sp., with fig.; DE LORIO.

Acteonina ogerieni, n. sp., with fig.; *id.*

Cylindritis ovalis, n. sp., with fig.; GREPPIN. *C. etalloni*, n. sp., with fig.; DE LORIO.

Tornatella: *T. vagabunda*, n. sp., with fig.; ROCHEBRUNE & MABILE.

TORNATINIDÆ.

Tornatina compacta, n. sp., with fig.; *T. lajenkaireana*, with fig.; *T. acerta*, with fig.; BENOIST.

Volvula bruguieri, n. sp., with fig.; *id.*

BULLIDÆ.

Bulla baristriata, n. sp., with fig.; BRIART & CORNET.

Hamineu perrieri, n. sp., with fig.; MORLET.

RINGICULIDÆ.

Avellana subincrassata, n. sp., with fig.; GRIEPENKERL.

APLYSIIDÆ.

Aplysia, circulatory system, &c.; RIVIÈRE (3, 5): hermaphroditism; ROBERT: reproductive organs; MAZZARELLI (1, 3): secretions of the glands of Vayssière, and of branchial glands; *id.* (2): reproductive apparatus; SAINT-LOUP: various species from Pacific described, also *A. chierchiana*, n. sp.; MAZZARELLI & ZUCCARDI. *A. æquorea*, n. sp., with fig.; HEILPRIN (1).

Dolabella: various species from Pacific described; MAZZARELLI & ZUCCARDI.

OXYNOIDÆ.

Lohiger : synonymy of species ; SMITH (2A). *L. wilsoni*, n. sp., with fig. ; TATE (2).

RUNCINIDÆ.

Peltida : classification.

Pelta : list of species.

Illica, n. g. ; *I. nana*, n. sp., with figs. BERGH.

UMBRELLIDÆ.

Umbrella corticalis, n. sp., with fig. ; TATE (2).

NUCLEOBRANCHIATA.

PTEROTRACHEIDÆ.

Pterotrachea coronata : eye ; GRENACHER.

PROSOBRANCHIATA.

Nervous system ; BROCK (1).

Excretory organ ; anatomy and histology ; PERRIER.

Prosobranchiata du Calcaire grossier de Mons ; BRIART & CORNET.

North-German Oligocene forms, with many species figured ; VON KOENEN.

TEREBRIDÆ.

Terebra : synopsis ; *T. subcatenifera*, n. sp., with fig. ; *T. mutica*, n. sp., with fig. ; *T. subspectabilis*, n. sp., with fig. ; *T. angulosa*, n. sp., with fig. ; *T. leptospira*, n. sp., with fig. ; *T. convexiuscula*, n. sp., with fig. ; TATE (5). *T. plicosa*, n. sp., with fig. ; VON KOENEN.

CONIDÆ.

Conus bairdowi, n. sp. ; *C. fulvus*, n. sp. ; SOWERBY (2). *C. bimarginatus*, n. sp. ; MAYER-EYMAR (5).

Daphnella payeni, n. sp., with fig. ; ROCHEBRUNE & MABILE.

Pleurotoma ; DE GREGORIO (1). *P. hyemalis*, n. sp., with fig. ; ROCHEBRUNE & MABILE. *P. (Mangelia) orionæ*, n. sp., with figs., Hongkong ; SOWERBY (1).

Clavatula : *C. zibinica*, n. sp., *C. decipiens*, n. sp., from Miocene ; PANTANELLI.

Mangelia obsoleta, n. sp. ; *id.*

Pleurotoma wilkii, n. sp. ; SOWERBY (2).

Savatieria, n. g. ; *S. frigida*, n. sp., with fig. ; ROCHEBRUNE & MABILE.

Admete frigida, n. sp., with fig. ; *iid.*

CANCELLARIIDÆ.

Cancellaria : synopsis ; TATE (5). *C. alveolata*, n. sp., with fig. ; *id.* (5). *C. bistriata*, n. sp., with fig. ; *C. buccinoides*, n. sp., with fig. ; VON KOENEN. *C. calvulata*, n. sp., with fig. ; *C. caperata*, n. sp., with fig. ; *C. capillata*, n. sp., with fig. ; TATE (5). *C. crassistria*, n. sp., with fig. ; *C. egregia*, n. sp., with fig. ; VON KOENEN. *C. epidromiformis*, n. sp., with fig. ; *C. exaltata*, n. sp., with fig. ; *C. gradata*, n. sp., with fig. ; TATE (5). *C. harpa*, n. sp., with fig. ; *C. hordeola*, n. sp., with fig. ; *C. interstitialis*, n. sp., with fig. ; *C. labratula*, n. sp., with fig. ; *C. lævigata*, n. sp., with fig. ; *O. lima*, n. sp., with fig. ; VON KOENEN. *C. micra*, n. sp., with fig. ; *C. modestina*, n. sp., with fig. ; TATE (5). *O. nassoides*, n. sp., with fig. ; *C. nitida*, n. sp., with fig. ; *C. orata*, n. sp., with fig. ; VON KOENEN. *C. ptychotropis*, n. sp., with fig. ; TATE (5). *C. rhombea*, n. sp., with fig. ; *C. rugosa*, n. sp., with fig. ; VON KOENEN. *C. semicostata*, n. sp., with fig. ; TATE (5). *O. simulata*, n. sp., with fig. ; *C. subcylindrica*, n. sp., with fig. ; *C. tenuistriata*, n. sp., with fig. ; *C. terebralis*, n. sp., with fig. ; *C. tumescens*, n. sp., with fig. ; *C. tumida*, n. sp., with fig. ; VON KOENEN. *C. turriculata*, n. sp., with fig. ; *C. wannonensis*, n. sp., with fig. ; TATE (5).

OLIVIDÆ.

Ancillaria canalis, n. sp., with fig. ; *A. digitalis*, n. sp., with fig. ; *A. intermedia*, n. sp., with fig. ; *A. obovata*, n. sp., with fig. ; VON KOENEN. *A. lunceolata*, n. sp., with fig. ; *A. ligata*, n. sp., with fig. ; *A. orycta*, n. sp., with fig. ; *A. pupillata*, n. sp., with fig. ; *A. subgradata*, n. sp., with fig. ; *A. subampliata*, n. sp., with fig. ; *A. pseudo-australis*, n. sp., with fig. ; TATE (5).

Oliva : nomenclature ; FORD (5). *O. addidæ*, n. sp., with fig. ; *O. angustata*, n. sp., with fig. ; TATE (5). *O. buloti*, n. sp., with fig. ; SOWERBY (1). *O. nymphalis* ; TATE (5).

HARPIDÆ.

Harpa abbreviata, n. sp., with fig. ; *H. cassinoides*, n. sp., with fig. ; *H. clathrata*, n. sp., with fig. ; *H. lamellifera*, n. sp., with fig. ; *H. pulligera*, n. sp., with fig. ; *H. spirata*, n. sp., with fig. ; *H. sulcosa*, n. sp., with fig. ; *H. tenuis*, n. sp., with fig. ; TATE (5).

MARGINELLIDÆ.

Marginella : œsophageal siphon ; BOUVIER (1). *M. doyei*, n. sp., with fig. ; ROCHEBRUNE & MABILE. *M. floccata*, n. sp. ; SOWERBY (2).

VOLUTIDÆ.

Lyria gemmata, n. sp., with fig. ; TATE (5).

Voluta adcocki, n. sp., with fig. ; *id.* (2). *V. alticosta*, n. sp., with fig. ; *V. ancilloides*, n. sp., with fig. ; *id.* (5). *V. braccata*, n. sp. ; ROCHE-

BRUNE & MABILE. *V. capitata*, n. sp., with fig.; *V. costellifera*, n. sp., with fig.; *V. crassilabrum*, n. sp., with fig.; *V. cribrosa*, n. sp., with fig.; *V. heptagonalis*, n. sp., with fig.; TATE (5). *V. latirittata*, n. sp., with fig.; GRIEPENKERL. *V. lineata*, n. sp., with fig.; TATE (5). *V. magnifica*, n. sp., with fig.; GRIEPENKERL. *V. masoni*, n. sp., with fig.; *V. mortoni*, n. sp., with fig.; *V. polita*, n. sp., with fig.; *V. protorhysa*, n. sp., with fig.; *V. sarissa*, n. sp., with fig.; TATE (5).

MITRIDÆ.

Mitridæ, with many figs.; BELLARDI.

Mitridæ: list of species; *M. zibinica*, n. sp., with figs.; TOLDO.

Diptychomitra scarabellii, n. sp., with figs.; *D. taramellii*, n. sp., with figs.; *id.*

Mitra atractoides, n. sp., with fig.; *M. atypa*, n. sp., with fig.; *M. biornata*, n. sp., with fig.; *M. cassida*, n. sp., with fig.; *M. citharelloides*, n. sp., with fig.; *M. clathurella*, n. sp., with fig.; *M. complanata*, n. sp., with fig.; *M. conoidalis*, n. sp., with fig.; *M. dennanti*, n. sp., with fig.; *M. escharoides*, n. sp., with fig.; *M. euglypha*, n. sp., with fig.; *M. exilis*, n. sp., with fig.; TATE (5). *M. formosensis*, n. sp., with fig.; SOWERBY (1). *M. leptalea*, n. sp., with fig.; *M. ligata*, n. sp., with fig.; TATE (5). *M. merula*, n. sp.; SOWERBY (2). *M. paucicostata*, n. sp., with fig.; TATE (5). *M. recurva*, n. sp., with fig.; SOWERBY (1). *M. semilævis*, n. sp., with fig.; TATE (5). *M. smithi*, n. sp., with fig.; SOWERBY (1). *M. sordida*, n. sp., with fig.; *M. subcrenularis*, n. sp., with fig.; *M. terebræformis*, n. sp., with fig.; *M. uniplica*, n. sp., with fig.; *M. varicosa*, n. sp., with fig.; TATE (5).

Mitrella hidalgoi, n. sp.; MONTESERATO (2).

Uromitra cognatella, n. sp., with figs.; *U. gentilis*, n. sp., with figs.; TOLDO.

FASCIOLARIDÆ.

Eburnopsis, n. g., allied to *Fusus*; *E. aulacæssa*, n. sp., with fig.; TATE (5).

Fasciolaria concinna, n. sp., with fig.; *F. cristata*, n. sp., with fig.; *F. cryptoploca*, n. sp., with fig.; *F. decipiens*, n. sp., with fig.; *F. exilis*, n. sp., with fig.; *id.* (1). *F. fusilla*, n. sp., with fig.; *id.* (5). *F. rugata*, n. sp., with fig.; *id.* (1).

Fusus acanthostrephus, n. sp., with fig.; *F. aciformis*, n. sp., with fig.; *F. aldingensis*, n. sp., with fig.; *id.* (1). *F. auerbachii*, n. sp., with fig.; VON KOENEN. *F. bulbodes*, n. sp., with fig.; *F. cochleatus*, n. sp., with fig.; *F. craspedotus*, n. sp., with fig.; TATE (1). *F. crassistriata*, n. sp., with fig.; VON KOENEN. *F. dictyotis*, n. sp., with fig.; TATE (1). *F. edwardsi*, n. sp., with fig.; *F. erectus*, n. sp., with fig.; *F. flexicosta*, n. sp., with fig.; VON KOENEN. *F. foliaceus*, n. sp., with fig.; *F. gippslandicus*, n. sp., with fig.; TATE (1). *F. hecticus*, n. sp., with fig.; VON KOENEN. *F. henicus*, n. sp., with fig.; TATE (5). *F. hexagonalis*, n. sp., with fig.; *F. incompositus*, n. sp., with fig.; *id.* (1). *F. labratellus*, n. sp., with fig.; *F. lutorfensis*, n. sp., with fig.; VON KOENEN. *F. müsiacus*, n. sp., with

fig. ; TOULA. *F. multispiratus*, n. sp., with fig. ; *F. multipunctatus*, n. sp., with fig. ; *F. pergracilis*, n. sp., with fig. ; *F. pratensis*, n. sp., with fig. ; *F. recticosta*, n. sp., with fig. ; *F. restans*, n. sp., with fig. ; *F. scrabellus*, n. sp., with fig. ; VON KOENEN. *F. sculptilis*, n. sp., with fig. ; *F. senticosus*, n. sp., with fig. ; *F. spiniferus*, n. sp., with fig. ; *F. stimuleus*, n. sp., with fig. ; TATE (1). *F. subterebralis*, n. sp., with fig. ; VON KOENEN. *F. tholoides*, n. sp., with fig. ; TATE (1). *F. unisulcatus*, n. sp., with fig. ; VON KOENEN.

Latirus elatus, n. sp., with fig. ; VON KOENEN.

Leucozonis micronema, n. sp., with fig. ; *L. staminea*, n. sp., with fig. ; *L. tumida*, n. sp., with fig. ; TATE (1).

Peristernia actinostrephe, n. sp., with fig. ; *P. affinis*, n. sp., with fig. ; *P. aldingensis*, n. sp., with fig. ; *P. altifrons*, n. sp., with fig. ; *P. apertata*, n. sp., with fig. ; *P. approximans*, n. sp., with fig. ; *P. interlineata*, n. sp., with fig. ; *P. morundiana*, n. sp., with fig. ; *P. murrayana*, n. sp., with fig. ; *id.* (1). *P. pumila*, n. sp., with fig. ; *id.* (5). *P. purpurea*, n. sp., with fig. ; *P. subundulosa*, n. sp., with fig. ; *id.* (1).

Sipho asperulus, n. sp., with fig. ; *S. labrosus*, n. sp., with fig. ; *F. formis*, n. sp., with fig. ; *id.* (1).

TURBINELLIDÆ.

Melapium: description, affinity, synonymy ; SMITH (1).

Fulgur: relation of *F. perversus* to *F. contrarius*, with figs. ; LEIDY.

Tudicula angulata, n. sp., with fig. ; *T. costata*, n. sp., with fig. ; *T. binata*, n. sp., with fig. ; TATE (1).

BUCCINIDÆ.

Cantharus varicosus, n. sp., with fig. ; TATE (1).

Cominella delandi, n. sp., with fig. ; *C. crassina*, n. sp., with fig. ; *Pertusa*, n. sp., with fig. ; *C. pumila*, n. sp., with fig. ; *C. subflicca*, n. sp., with fig. ; *id.* (1).

Euthria cerealis, n. sp., with fig. ; ROCHEBRUNE & MABILE. *E. sonbyi*, n. sp., with fig. ; SOWERBY (3).

Phos cominelloides, n. sp., with fig. ; *P. gregsoni*, n. sp., with fig. ; *Phos liracostatus*, n. sp., with fig. ; *P. tardicrescens*, n. sp., with fig. ; *P. tuculatus*, n. sp., with fig. ; TATE (1).

Zemira precursoria, n. sp., with fig. ; *id.* (1).

NASSIDÆ.

Canidia pariei, n. sp., with fig. ; MORLET.

Nassa (*Dorsanum*) *arquistriatum*, n. sp., with figs. ; *N. (Hinia) reclusi*, n. sp., with figs. ; *N. solitaria*, n. sp., with figs. ; DOLLFUS. *N. joazeiroi*, n. sp. ; MONTESEKATO (2). *N. crassigranosa*, n. sp., with fig. ; TATE.

Pisania semicostata, n. sp., with fig. ; *P. purpuroides*, with fig. ; *breris*, n. sp., with fig. ; *id.* (1).

Siphonalia lamellifera, n. sp., with fig. ; *S. longirostris*, n. sp., with fig. ; *S. spatiosa*, n. sp., with fig. ; *id.* (1).

MURICIDÆ.

Concholepas patagonicus, n. sp., with fig. ; ROCHEBRUNE & MABILE.

Donorania affinis, n. sp. ; *D. procerula*, n. sp. ; MONTESERATO (2).

Murex corneus, Linn., description, with synonymy ; BRAZIER (2). *M. detritus*, n. sp., with fig. ; *M. elatior*, n. sp., with fig. ; *M. fasciaria*, n. sp., with fig. ; VON KOENEN. *M. goniophorus*, n. sp., with fig. ; *M. snissodus*, n. sp., with fig. ; *M. oliganthus*, n. sp., with fig. ; EUTHYME. *M. sandbergeri*, n. sp., with fig. ; *M. tenuispira*, n. sp., with fig. ; *M. trialatus*, n. sp., with fig. ; VON KOENEN. *M. adelaidensis*, n. sp., with fig. ; *M. amblyceras*, n. sp., with fig. ; *M. asteriscus*, n. sp., with fig. ; *M. bifrons*, n. sp., with fig. ; *M. campylotropis*, n. sp., with fig. ; *M. crassiliratus*, n. sp., with fig. ; *M. didymus*, n. sp., with fig. ; *M. hamiltonensis*, n. sp., with fig. ; *M. legrandi*, with fig. ; *M. alveolatus*, n. sp., with fig. ; *M. asperulus*, n. sp., with fig. ; *M. biconicus*, n. sp., with fig. ; *M. basicinctus*, n. sp., with fig. ; *M. calvus*, n. sp., with fig. ; *M. dennanti*, n. sp., with fig. ; *M. eyrei*, with fig. ; *M. irregularis*, n. sp., with fig. ; *M. lophoessus*, n. sp., with fig. ; *M. manubriatus*, n. sp., with fig. ; *M. pachystirus*, n. sp., with fig. ; *M. rhyusus*, n. sp., with fig. ; *M. tenuicornis*, n. sp., with fig. ; *M. trinodosus*, n. sp., with fig. ; *M. velificus*, n. sp., with fig. ; *M. minutus*, with fig. ; *M. priodontus*, n. sp., with fig. ; *M. sublaevis*, n. sp., with fig. ; *M. tridentatus*, n. sp., with fig. ; *M. trochispira*, n. sp., with fig. ; TATE (1).

Purpura abjecta, n. sp., with fig. ; *id.* (1). *P. lapillus*, distribution and variation ; COOKE (3) : purple ; LETELLIER (2).

Ocenebra jenkinsii, n. sp. ; BAKER (2).

Trophon lebruni, n. sp. ; *T. candidatus*, n. sp., with fig. ; *T. dispar*, n. sp., with fig. ; *T. violaceus*, n. sp., with fig. ; ROCHEBRUNE & MABILE. *T. anceps*, n. sp., with fig. ; *T. hypsellus*, n. sp., with fig. ; *T. mangelioides*, n. sp., with fig. ; *T. torquatus*, n. sp., with fig. ; *T. brevicaudatus*, n. sp., with fig. ; *T. icosiphyllus*, n. sp., with fig. ; *T. monotropis*, n. sp., with fig. ; TATE (1).

Typhis acanthopterus, n. sp., with fig. ; *T. disjunctus*, n. sp., with fig. ; *T. eraricosus*, n. sp., with fig. ; *T. laciniatus*, n. sp., with fig. ; *T. tripterus*, n. sp., with fig. ; *id.* (1).

Vitularia curtansata, n. sp., with fig. ; *id.* (1).

CORALLIOPHILLIDÆ.

Coralliophila andamana, n. sp., with fig. ; MELVILL.

Purpurouidea gracilis, n. sp., with fig. ; DE LORRIOL (2).

Ricinuia subreticulata, n. sp., with fig. ; TATE (1).

TRITONIDÆ.

Epidromus nodulatus, n. sp., with fig. ; *E. citharellus*, n. sp., with fig. ; *E. leptoskeles*, n. sp., with fig. ; *E. tecturatus*, n. sp., with fig. ; *E. turritus*, n. sp., with fig. ; TATE (1).

Triton : conchological note ; CRAWSHAW (1). *T. abbreviatus*, n. sp. ; VON KOENEN. *T. annectans*, n. sp., with fig. ; *T. crassicoelatus*, n. sp.,

with fig. ; *T. cyphus*, n. sp., with fig. ; *T. armatus*, n. sp., with fig. ; *T. cribrerosus*, n. sp., with fig. ; TATE (1). *T. detritus*, n. sp., with fig. : VON KOENEN. *T. gemmulatus*, n. sp., with fig. ; *T. gibbus*, n. sp., with fig. : TATE (1). *T. multigranus*, n. sp. ; VON KOENEN. *T. oligostirus*, n. sp., with fig. ; *T. protensus*, n. sp., with fig. ; *T. sezcostatus*, n. sp., with fig. ; *T. tortirostris*, n. sp., with fig. ; *T. woodsii*, n. sp., with fig. ; *T. oroidens*, n. sp., with fig. ; *T. radialis*, n. sp., with fig. ; *T. textilis*, n. sp., with fig. ; *T. tumulosus*, n. sp., with fig. ; TATE (1).

Tritonium gemmiferum, n. sp., with fig. ; *T. pustulatum*, n. sp., with fig. : EUTHYME.

COLUMBELLIDÆ.

Chilodonta bayani, n. sp., with fig. ; DE LORIOI.

CASSIDIDÆ.

Cussidaria echinata, n. sp., with fig. ; VON KOENEN. *C. gradata*, n. sp., with fig. ; TATE (5). *C. tenuis*, n. sp., with fig. ; VON KOENEN. *C. wilsoni*, n. sp., with fig. ; TATE (5).

Pseudoliva rudis, n. sp., with fig. ; VON KOENEN.

DOLIDÆ.

Ficula crassistriata, n. sp., with fig. ; *T. tenuis*, n. sp., with fig. ; VON KOENEN.

Semicassis mülleri, n. sp., with fig. ; *S. radiata*, n. sp., with fig. ; *S. subgranosa*, n. sp., with fig. ; *S. transenna*, n. sp., with fig. ; *S. trinodosa*, n. sp., with fig. ; TATE (5).

CYPREIDÆ.

Cypræa : notes on species ; CAMPBELL. *C. renusta*, with figs. ; COX. *Ovulum haynesi*, n. sp., with figs., from W. Australia ; SOWERBY (1).

STROMBIDÆ.

Aporrhais margarita, n. sp., with fig. ; *A. sulcifera*, n. sp., with fig. : GRIEPENKERL.

Rostellaria integra, n. sp., with fig. ; VON KOENEN. *R. mutabilis*, n. sp. *R. tallavignesi*, n. sp. ; MAYER-EYMAR (5).

Strombus martapuraensis, n. sp., with fig. ; MARTIN (2). *S. nodosus*, with fig. ; SIMONELLI (2).

CHENOPODIDÆ.

Alaria hamoides, n. sp., with fig. ; *A. primigenia*, n. sp., with fig. ; *A. varicifera*, n. sp., with fig. : HUDDLESTON.

Terebellum striatum, n. sp., with fig. : VON KOENEN.

STRUTHIOLABIIDÆ.

Struthiolaria lirata, n. sp., with figs. ; TATE (5).

CERITHIIDÆ.

Brachytrema cossmanni, n. sp., with figs. ; *B. parvula*, n. sp., with figs. ; GREPPIN.

Ceritella scalariformis, n. sp., with fig. ; *C. multivoluta*, n. sp., with fig. ; *C. actæoniformis*, n. sp., with fig. ; *id.*

Cerithium abbas, n. sp., with fig. ; *C. angustivoluta*, n. sp., with fig. ; *C. attritum*, n. sp., with fig. ; *C. beanii*, n. sp., with fig. ; HUDDLESTON. *C. carryense*, n. sp., with fig. ; DÉPÉRET. *C. clypeus*, n. sp., with fig. ; HUDDLESTON. *C. conditum*, n. sp., with fig. ; MAYER-EYMAR (3). *C. georgii*, n. sp., with fig. ; HUDDLESTON. *C. heptagonum*, n. sp., with fig. ; MAYER-EYMAR (3). *C. laningenense*, n. sp., with fig. ; GRIEPENKERL. *C. luteisulcatum*, n. sp., with fig. ; *C. leckhamptonense*, n. sp., with fig. ; *C. limæforme*, n. sp., with fig. ; *C. lindonensis*, n. sp., with fig. ; *C. obesum*, n. sp., with fig. ; *C. obornense*, n. sp., with figs. ; *C. pergradatum*, n. sp., with fig. ; *C. pisoliticum*, n. sp., with fig. ; HUDDLESTON. *C. planum*, n. sp., with fig. ; GRIEPENKERL. *C. polystrophum*, n. sp., with fig. ; *C. subcostigerum*, n. sp., with fig. ; HUDDLESTON. *C. tetralix*, n. sp., with fig. ; *C. trilir*, n. sp., with fig. ; GRIEPENKERL. *C. wansfordiæ*, n. sp., with fig. ; HUDDLESTON. *C. anticurrens*, n. sp. ; *C. familiaris*, n. sp. ; *C. palladii*, n. sp. ; MAYER-EYMAR (5). *C. anas*, n. sp., with fig. ; *C. bourgeati*, n. sp., with fig. ; *C. chantrei*, n. sp., with fig. ; *C. charpyi*, n. sp., with fig. ; *C. galur*, n. sp., with fig. ; *C. josephense*, n. sp., with fig. ; *C. schlosseri*, n. sp., with fig. ; *C. valsinense*, n. sp., with fig. ; DE LORIOI. *C. kobyi*, n. sp., with fig. ; *C. sancti-jacobi*, n. sp., with fig. ; *C. bicinctum*, n. sp., with fig. ; *C. contractum*, n. sp., with fig. ; *C. productum*, n. sp., with fig. ; *C. semiornatum*, n. sp., with fig. ; *C. ventricosum*, n. sp., with fig. ; GREPPIN.

Cerithinella bajocensis, n. sp., with fig. ; *C. brodiei*, n. sp., with fig. ; HUDDLESTON.

Eustoma jurassense, n. sp., with fig. ; DE LORIOI.

Erelissa guiraudi, n. sp., with fig. ; *id.* *E. papillosa*, n. sp., with fig. ; GREPPIN.

Pseudalaria, n. g. ; HUDDLESTON.

Telescopium titan, n. sp., with fig. ; MARTIN (5).

NERINEIDÆ.

Aptzyziella etalloni, n. sp., with fig. ; DE LORIOI (2).

Nerinea chantrei, n. sp., with fig. ; *N. guirandi*, n. sp., with fig. ; *N. turbutrix*, n. sp., with fig. ; *id.* (2) *N. borneensis*, n. sp., with fig. ; *N. djaricanensis*, n. sp., with fig. ; *N. hoosei*, n. sp., with fig. ; *N. horneri*, n. sp., with fig. ; *N. murtapurensis*, n. sp., with fig. ; *N. schwaneri*, n. sp., with fig. ; *N. sedetensis*, n. sp., with fig. ; *N. sundaica*, n. sp., with fig. ; MARTIN (2).

VERMETIDÆ.

Serpulorbis deshayesi, n. sp., with fig.; *S. planorbiformis*, n. sp., with fig.; MAYER-EYMAR (4).

TURRITELLIDÆ.

Eligmostoma, n. g. (*Turritellidæ*); COSSMANN.

Mathildia bouryi, n. sp., with fig.; *id.*

Turritella cisalpina, n. sp.; MAYER-EYMAR (5). *T. cuisensis*, n. sp., with fig.; COSSMANN. *T. couteaudi*, n. sp.; *T. elachista*, n. sp.; ROCHEBRUNE & MABILE. *T. echinata*, n. sp., with fig.; DEPÉRET. *T. firmata*, n. sp., with fig.; MAYER-EYMAR (4). *T. lessepsi*, n. sp., with fig.; *id.* (1). *T. limata*, n. sp., with fig.; GRIEPENKERL. *T. parisiuna*, n. sp., with fig.; MAYER-EYMAR (1).

CÆCIDÆ.

Uccum bezanconi, n. sp., with fig.; COSSMANN. *C. glabrum*, with fig.; *C. stvensoni*, n. sp., with fig.; MEYER. *C. termes*, n. sp., with fig.; HEILPRIN (1). *C. virginianum*, n. sp., with fig.; MEYER.

PSEUDOMELANIIDÆ.

Buyania lanbrieri, n. sp., with fig.; *B. bourdoti*, n. sp., with fig.; *B. essomiensis*, n. sp., with fig.; COSSMANN.

Loxonema binodosa, n. sp., with fig.; WÖHRMANN. *L. naticoides*, n. sp., with fig.; *L. pygmæum*, n. sp., with fig.; HOLZAPFEL (2).

Macrocheilus: genus criticized; KEYES (6).

Onia exilis, n. sp., with fig.; *O. guirandi*, n. sp., with fig.; DE LORIOI (2).

Orthonema pygmæum, n. sp. (figs.); *O. youngianum*, n. sp. (figs.); DONALD.

Soleniscus: definition; KEYES (6).

Pseudomelania valfinensis, n. sp., with fig.; DE LORIOI (2).

Sphaerodoma, n. g., allied to *Macrochilus*; KEYES (5).

MELANIIDÆ.

Balanocochlis eulimoides, n. sp., with fig.; COSSMANN.

Bouryia, n. g. (*Melaniidæ*); *B. polygyrata*, n. sp., with fig.; *B. conrexiuscula*, n. sp., with fig.; *id.*

Fuunus rissoinaeformis, n. sp., with fig.; *id.*

Melania auroriana, n. sp., with fig.; *M. schmacheri*, n. sp., with fig.; HARTMAN. *M. multistriata*, n. sp., with fig.; WÖHRMANN.

Melanopsis: figures of very many estuarine fossils; SACCO. *M. lactacea*, n. sp., with fig.; *M. mausseneti*, n. sp., with fig.; COSSMANN.

Paludomus futaii, n. sp.; GREDLER. *P. lacunoides*, n. sp., with figs.; ALDRICH.

LITTORINIDÆ.

Dissocylus, n. g. ; COSSMANN.

Lacuna craspedomphalus, n. sp., with fig. ; *L. circumvallata*, n. sp., with fig. ; *L. wuteleti*, n. sp., with fig. ; *L. compressa*, n. sp., with fig. ; *L. cuisensis*, n. sp., with fig. ; *L. nitidissima*, n. sp., with fig. ; *L. amaura*, n. sp., with fig. ; *L. aperta*, n. sp., with fig. ; *L. eurydictium*, n. sp., with fig. ; *L. actæonoides*, n. sp., with fig. ; *L. aratula*, n. sp., with fig. ; *L. cochlearella*, n. sp., with fig. ; *L. chevallieri*, n. sp., with fig. ; *L. bouryi*, n. sp., with fig. ; *id.* *L. lineata*, n. sp., with fig. ; BRIART & CORNET.

Littorina bernayi, n. sp., with fig. ; COSSMANN.

Lacundon, n. g. ; *L. bernayi*, n. sp., with fig. ; *L. reflexilabrum*, n. sp., with fig. ; *id.*

Lacunoptyxis, n. g. ; *id.*

SOLARIIDÆ.

Discohelix plicatella, n. sp., with fig. ; COSSMANN.

Euomphalus calciferus, n. sp., with fig. ; *E. priscus*, n. sp., with fig. ; WHITFIELD.

Solarium montense, n. sp., with fig. ; BRIART & CORNET.

LITIOPIDÆ.

Dialu copensis, n. sp. ; SOWERBY (2).

RISSOIIDÆ.

Barlecia simplex, n. sp., with fig. ; BRIART & CORNET.

Ceratia minutissima, n. sp., with fig. ; COSSMANN.

Dialopsis, n. g. ; *id.*

Diastictus, n. g. ; *id.*

Horea, n. subg. for *Rissoa ponsonbyi* ; SMITH (4).

Pseudolaphrus, n. g. : *P. angustus*, n. sp., with fig. ; *P. proavius*, n. sp., with fig. ; COSSMANN.

Rissoa eurydictium, n. sp., with fig. ; *id.*

Rissoa : *B. craticula*, n. sp., with fig. ; *R. incerta*, n. sp., with fig. ; BRIART & CORNET. *B. parvula*, n. sp., with fig. ; GREPPIN. *R. pulchra*, n. sp., with fig. ; *R. tenuis*, n. sp., with fig. ; BRIART & CORNET.

Rissoina labrata, n. sp., with fig. ; *R. nuda*, n. sp., with fig. ; *iid.* *R. pygmaea*, n. sp., with fig. ; COSSMANN. *R. tenuicancellata*, n. sp., with fig. ; BRIART & CORNET.

Sculiola bouryi, n. sp., with fig. ; COSSMANN.

HYDROBIIDÆ.

Amnicola paracuta, n. sp., with fig. ; PILSBRY (8).

Briartia carinata, n. sp., with fig. ; BRIART & CORNET.

Bythinia : *B. carinata*, n. sp., with fig. ; *iid.* *B. critica*, n. sp. ; GREDLER (1). *B. leberonica*, n. sp., with fig. ; MAYER-EYMAR (4). *B. longula*,

n. sp., with fig.; BRIART & CORNET. *B. oxyspira*, n. sp., with fig.; COSSMANN. *B. pupiformis*, n. sp., with fig.; *B. regularis*, n. sp., with fig.; *B. vicina*, n. sp., with fig.; BRIART & CORNET.

Bythinella æquicostata, n. sp., with fig.; PILSBRY (8). *B. cirsiophora*, n. sp., with fig.; COSSMANN. *B. fuscata*, n. sp.; *B. longula*, n. sp.; *B. melano-stomum*, n. sp.; BRANSIK. *B. plicistria*, n. sp., with fig.; *B. sphaeroidalis*, n. sp., with fig.; COSSMANN.

Cavilabium, n. g.; *id.*

Hydrobia in Thames valley; MARSHALL.

Hydrobia: British forms; SMITH (8).

Hydrobia alabastrina, n. sp., with fig.; MORELET (1). *H. bouryi*, n. sp., with fig.; COSSMANN. *H. depressa*, n. sp., with fig.; *H. elongata*, n. sp., with fig.; BRIART & CORNET. *H. jenkinsii*, n. sp.; SMITH (8). *H. lanbrieri*, n. sp., with fig.; COSSMANN. *H. minutissima*, n. sp., with fig.; BRIART & CORNET. *H. monroensis*, with figs. and synonymy; PILSBRY (8). *H. nana*, n. sp., with fig.; *H. regularis*, n. sp., with fig.; *H. tenuis*, n. sp., with fig.; BRIART & CORNET. *H. tristis*, n. sp., with fig.; MORELET (1).

Keilostoma typica, n. sp., with fig.; BRIART & CORNET.

Larletia fagoti, n. sp., with fig.; *L. garnieri*, n. sp., with fig.; *L. sayni*, n. sp., with fig.; *L. subcylindrica*, n. sp., with fig.; SAYN (1).

Paryphystoma decemliratum, n. sp., with fig.; COSSMANN.

Stenothyra cuneata, n. sp., with fig.; *id.*

Syrnolopsis carinifera, n. sp., with fig.; SMITH (4).

PALUDINIDÆ.

Melantho pehoana, n. sp.; GREDLER (1).

Neothauma: species and varieties of *N. tanganyicense*; SMITH (4).

Paludina danieli, n. sp., with fig.; MORLET. *P. delarayana*, n. sp.; HEUDE (1). *P. lamberti*, n. sp., with fig.; BRIART & CORNET. *P. lupidea*, n. sp.; *P. lithophuga*, n. sp.; *P. longispira*, n. sp.; *P. magnaciana*, n. sp.; *P. oxytropoides*, n. sp.; HEUDE (1). *P. paviæ*, n. sp., with fig.; *P. sabina*, n. sp., with fig.; MORLET.

VALVATIDÆ.

Valvata: monograph of French species; LOCARD (4). *V. broumii*, n. sp.; CARPENTER. *V. bouryi*, n. sp., with fig.; COSSMANN. *V. cyclonophala*, n. sp.; ANON (1). *V. piscinulis*: reproductive organs; GARNAULT (2). *V. raboi*, n. sp.; ANON (1).

AMPULLARIIDÆ.

Ampullaria begini, n. sp., with fig.; MORLET. *A. depressa*: development; RYDER (3). *A. georgii*, n. sp.; WILLIAMS (7). *A. georgii*, Williams?; SMITH (5).

ASSIMINEIDÆ.

Assiminea in Thames valley; MARSHALL.

Assiminea contracta, n. sp., with fig.; *A. eburnoides*, n. sp., with fig.; COSSMANN. *A. ponsonbyi*, n. sp., with fig.; MORELET (1).

CYCLOPHORIDÆ.

Cyclophorus plateni, n. sp.; DOHEN. *C. smithi*, n. sp., with fig.; HIDALGO. *C. telifier*, n. sp.; MÖLLENDORFF. *C. translucens*, n. sp.; HEUDE (2).

Cyclotus enzonus, n. sp.; DOHEN. *C. herzi*, n. sp., with fig.; BÄTTGER (9).

Diplommatina albata, n. sp., with fig.; *D. aurea*, n. sp., with fig.; *D. crassilabris*, n. sp., with fig.; *D. gibboni*, n. sp., with fig.; *D. lutea*, n. sp., with fig.; *D. patula*, with figs.; *D. platycheilus*, n. sp., with figs.; *D. rubella*, n. sp., with figs.; *D. strigata*, var. *kororensis*, with figs.; BEDDOME.

Leptopoma mouhoti, var.; SMITH (9). *L. superbum*, n. sp.; DOHEN.

Megulostoma eurybasis, n. sp., with fig.; COSSMANN.

Megulomastoma quadrasi, n. sp., with fig.; HIDALGO.

Opisthoporus pulchellus, n. sp., with fig.; MORLET.

Ostodes liberatus, n. sp.; ANCEY (10).

Pupinella louisianensis, n. sp., with figs.; *P. macgregori*, n. sp., with figs.; *P. minor*, n. sp., with figs.; *P. rosseliana*, n. sp., with figs.; SMITH (6).

Pomatias proximum, n. sp., with fig.; COSSMANN.

Pterocyclus perrieri, n. sp., with fig.; MORLET.

Alcyaeus everetti, n. sp., with figs.; *A. galbanus*, n. sp., with figs.; *A. globosus*, with figs.; *A. hosei*, n. sp., with figs.; *A. specus*, n. sp., with figs.; *A. spiracellum*, with figs.; GODWIN-AUSTEN (2).

Cyclophorus niahensis, n. sp., with figs.; *C. cochraney*, n. sp.; *C. talboti*, n. sp.; *C. phlegethon*, n. sp.; *id.* (2).

Cyclotus boxalli, n. sp., with figs.; *C. trusanensis*, n. sp., with figs.; *C. linitus*, n. sp., with figs.; *id.* (2).

Diplommatina adversa, with fig.; *D. isseli*, n. sp., with figs.; *D. busanensis*, n. sp., with figs.; *D. niahensis*, n. sp., with figs.; *D. rubra*, n. sp., with fig.; *D. spinosa*, n. sp., with figs.; *id.* (2).

Georissa hosei, n. sp., with fig.; *G. hungerfordi*, n. sp., with fig.; *G. niahensis*, n. sp., with fig.; *G. williamsi*, n. sp., with fig.; *id.* (2).

Jerdonia borneensis, n. sp., with figs.; *id.* (2).

Leptopoma sericatum: description; *id.* (2).

Lagocheilus dido, n. sp., with fig.; *L. keppeli*, n. sp., with fig.; *L. mundayanus*, n. sp., with figs.; *id.* (2).

Opisthoporus pterocycloides, with figs.; *id.* (2).

Opisthostoma grandi-spinosum, n. sp., with figs.; *id.* (2).

Pterocyclus tenuilabiat, with figs.; *P. niahensis*, n. sp., with figs.; *P. cuculus*, n. sp., with figs.; *id.* (2).

Pupina dorie, n. sp., with figs.; *P. evansi*, n. sp., with figs.; *P. hosei*, n. sp., with figs.; *id.* (2).

Rhiostoma cavernæ, n. sp., with figs.; *R. guendoleni*, n. sp., with figs.; *R. hungerfordi*, n. sp.; *R. iris*, n. sp.; *id.* (2).

CYCLOSTOMATIDÆ.

Cyclostomata from Sicily: FAGOT.

Cyclostoma mathildæformis, n. sp., with fig.; *C. parvisulcata*, n. sp., with fig.; BRIART & CORNET.

ACICULIDÆ.

Acme reneta, with fig.; *A. gentilei*, n. sp., with fig.; *A. pironæ*, n. sp., with fig.; POLLONERA (5).

TRUNCATELLIDÆ.

Truncatella cylindrata, n. sp., with fig.; *T. minor*, n. sp., with fig.; BRIART & CORNET. *T. distensa*, n. sp., with fig.; COSSMANN.

HIPPONYCIDÆ.

Hipponix imbricata, n. sp., with fig.; BRIART & CORNET. *H. laubrieri*, n. sp., with fig.; COSSMANN.

CAPULIDÆ.

Amathina imbricata, n. sp., with figs., Mauritius; SOWERBY (1).

Crepidula glauca; FORD (3).

Crypta subdilata, n. sp.; ROCHEBRUNE & MABILE.

Metoptoma davyi, n. sp., with fig.; BARROIS (1). *M. alta*, n. sp., with fig.; WHITFIELD.

Mitularia boutillieri, n. sp., with fig.; COSSMANN.

Pileopsis inevoluta, n. sp., with fig.; BRIART & CORNET.

Pleniothyreus, n. g. (*Cupulidæ*); COSSMANN.

Potamoclis truncata, n. sp., with fig.; BRIART & CORNET.

Platyceras equilaterum, with fig.; KEYES (7). *P. romingeri*, n. sp.; WALCOTT (1). *P. costatum*, n. sp., with fig.; *P. zinkenii*, with fig.; *P. acutum*, with fig.; *P. acutissimum*, with fig.; *P. campanulatum*, n. sp., with fig.; *P. contortum*, n. sp., with fig.; *P. verrucosum*, n. sp., with fig.; *P. hercynicum*, with fig.; *P. selcanum*, with fig.; *P. undulatum*, n. sp., with fig.; *P. dubium*, n. sp., with fig.; *P. trigonale*, n. sp., with fig.; *P. inequilaterale*, n. sp., with fig.; *P. extensum*, n. sp., with fig.; *P. aculeatum*, n. sp., with fig.; *P. conoideum*, n. sp., with fig.; BARROIS (1). *P. conicum*, with fig.; *P. quinquemuatum*, with fig.; *P. plicatum*, n. sp., with fig.; WHITEAVES. *P. capax*, n. sp., with figs.; *P. formosum*, n. sp., with figs.; *P. latum*, n. sp., with figs.; *P. obliquum*, n. sp., with figs.; KEYES (2).

Strophostylus: *Platyceras (Strophostylus) naticoides*, with fig.; *P. (Strophostylus) orthostoma*, n. sp., with fig.; BARROIS (1).

XENOPHORIDÆ.

Onustus muttensis, n. sp., with fig.; GREPPIN.

Xenophora bouryi, n. sp., with fig.; COSSMANN.

NABICIDÆ.

Cymenorytis, n. g.; *C. conica*, n. sp., with fig.; *C. denssulcata*, n. sp., with fig.; COSSMANN.

Escharella, n. g. ; *E. citharella*, n. sp., with fig. ; *E. decussata*, n. sp., with fig. ; *E. absoluta*, n. sp., with fig. ; *id.*

Narica alta, n. sp., with fig. ; *id.*

LAMELLARIIDÆ.

Lamellaria hyadesi, n. sp. ; ROCHEBRUNE & MABILE.

NATICIDÆ.

Ampullina ligata, n. sp., with fig. ; COSSMANN.

Eunaticina guiraudi, n. sp., with fig. ; DE LORIO.

Natica babylonica, n. sp. ; MAYER-EYMAR (5). *N. bubendorfsensis*, n. sp., with fig. ; *N. formosa*, n. sp., with fig. ; GREPPIN. *N. boutillieri*, n. sp., with fig. ; *N. riviparoides*, n. sp., with fig. ; *N. pseudoclimax*, n. sp., with fig. ; COSSMANN. *N. pisum*, n. sp., with fig. ; MAYER-EYMAR (3). *N. ronaulti*, n. sp. ; *id.* (5). *N. secunda*, n. sp. ; *N. omoia*, n. sp. ; *N. payeni*, n. sp., with fig. ; *N. recognita*, n. sp., with fig. ; ROCHEBRUNE & MABILE. *Payraudeantia alleryana*, n. sp. ; *P. peloritana*, n. sp. ; SULIOTTI (2).

SUBITULITIDÆ.

Bulimorpha : list of forms ; KEYES (4).

Polyphemopsis in America all really *Bulimorpha* ; *id.* (4).

ADEORBIIDÆ.

Adeorbis radiata, n. sp., with fig. ; *A. simplex*, n. sp., with fig. ; BRIART & CORNET.

JANTHINIDÆ.

Janthina : history, with woodcuts ; BOUVIER (2). *J. courcelli*, n. sp., with fig. ; ROCHEBRUNE & MABILE.

SCALARIIDÆ.

Acrilla : *A. marolæ*, with fig. ; *A. coppii*, n. sp., with fig. ; DE BOURY.

Circuloscala italica, n. sp., with fig. ; *id.*

Clathroscala ; n. subg. : *C. cattulloi*, n. sp., with fig. ; *id.*

Clathrus : *C. proximus*, n. sp., with fig. ; *C. gregorii*, n. sp., with fig. ; *C. spretus*, n. sp., with fig. ; *C. elegans*, with fig. ; *C. (?) bruyonei*, n. sp., with fig. ; *id.*

Foratiscala : *F. tenuistrata*, with fig. ; *id.*

Gyroskala : *G. pantanelli*, de Boury (nom. mut.) ; *G. obscura*, de Boury (nom. mut.) ; *id.*

Hemiincirsa, n. subg. ; *id.*

Hyaloscala, n. subg. ; *id.*

Nodiscala, n. g. ; *N. cavata*, n. sp., with fig. ; *id.*

Punctiscala, n. subg. : *P. plicosa*, with fig. ; *P. forestii*, n. sp., with fig. ; *id.*

Turriscala, n. subg. ; *id.*

Pliciscala abrupta, with fig. ; *id.*

Species *incertæ sedis*, pp. 277-326 ; *id.*

Scalaria taurinensis, with fig. ; *S. depressicostata*, n. sp. ; *S. stefanii*, n. sp. ; *id.*

Scalidæ of Pliocene and Miocene : revision ; *id.*

Scalaria angulata in New Jersey ; FORD (1). *S. chevallieri*, n. sp., with fig. ; *S. acanthodes*, n. sp. ; COSSMANN. *S. fenestrata*, n. sp., with figs. ; WÖHRMANN. *S. limbata*, n. sp., with fig. ; GRIEPENKERL.

Stenorhytis retusa, with fig. ; *S. subglobosa*, n. sp., with fig. ; DE BOURY.

EULIMIDÆ.

Eulima epsterion, n. sp., with fig. ; MELVILL. *E. goniophora*, n. sp., with fig. ; *E. spinula*, n. sp., with fig. ; *E. subimbricata*, n. sp., with fig. ; *E. rectilabrum*, n. sp., with fig. ; COSSMANN.

Leiostraca carforti, n. sp., with fig. ; ROCHEBRUNE & MABILE.

PYRAMIDELLIDÆ.

Odontostomia macroptyxis, n. sp., with fig. ; *O. nisoides*, with fig. ; *O. linnaeiiformis*, n. sp., with fig. ; COSSMANN.

Stylifer brunneus, n. sp., with fig. (parasitic on *Strongylocentrotus*) ; TATE (2). *S. eulimoides*, n. sp., with fig. ; *S. propinquus*, n. sp., with fig. ; *S. terebralis*, n. sp., with fig. ; COSSMANN.

Syrnolu emarginata, n. sp., with fig. ; *S. pupoides*, n. sp., with fig. ; *S. bernayi*, n. sp., with fig. ; *S. chinacina*, n. sp., with fig. ; *S. goniophora*, n. sp., with fig. ; *S. carinulata*, n. sp., with fig. ; *S. conulus*, n. sp., with fig. ; *id.*

Turbinella leymeriei, n. sp. ; MAYER-EYMAR (5).

Turbonilla delpretei, n. sp. ; SULIOTTI (2). *T. morleti*, n. sp., with fig. ; *T. suturalis*, n. sp., with fig. ; COSSMANN.

HELICINIDÆ.

Helicina, n. sp. (single dead shell) ; SMITH (6). *Helicina* in Antilles ; *id.* (3). *H. altivaga*, n. sp. ; ANCEY. *H. bourailensis*, n. sp., with fig. ; HARTMAN. *H. congener*, n. sp., with figs. ; SMITH (6). *H. nehoueensis*, n. sp., with fig. ; HARTMAN. *H. occulta* : distribution ; KEYES (9). *H. sazona* : distribution ; HARTMAN. *H. usukanensis*, n. sp., with figs. ; GODWIN-AUSTEN.

HYDROCENIDÆ.

Georissa anæmata, n. sp. ; GREDLER (1).

NERITIDÆ.

Neritidæ : note on the shells : CRAWSHAW (2).

Nerita baudoni, n. sp., with fig. : COSSMANN. *N. buignieri*, with fig. ; NEWTON.

Neritina fabula, n. sp., with fig. ; *N. montensis*, n. sp., with fig. ; BRIART & CORNET. *N. lanbrieri*, n. sp., with fig. ; *N. bouryi*, n. sp., with fig. ; COSSMANN.

Pileolus valfinensis, n. sp., with fig. ; DE LORIO.

Tomostomu rostratum, n. sp., with fig. ; COSSMANN.

NERITOPSIDÆ.

Naticopsis : KEYES (8).

Neritopsis multicostata, n. sp., with fig. ; BRIART & CORNET. *N. paucicornata*, n. sp., with fig. ; WÖHRMANN.

TURBINIDÆ.

Amblerleyi bezanconi, n. sp., with fig. ; COSSMANN.

Collonia flammulata, n. sp., with fig. ; *C. textiliosa*, n. sp., with fig. ; *C. obsoleta*, n. sp., with fig. ; *C. lanbrierii*, n. sp., with fig. ; *C. goniomphalus*, n. sp., with fig. ; *id.*

Horiotoma involutus, n. sp., with fig. ; *H. polygonum*, n. sp., with fig. ; *H. disjunctum*, n. sp., with fig. ; BARROIS (1).

Phasianella lanbrieri, n. sp., with fig. ; *P. succineopsis*, n. sp., with fig. ; *P. herouvalensis*, n. sp., with fig. ; COSSMANN. *P. oolithica*, n. sp., with fig. ; GREPPIN.

Turbo borinstorfensis, n. sp., with fig. ; GRIEPENKERL. *T. bourgeati*, n. sp., with fig. ; DE LORIO. *T. bretoni*, n. sp., with fig. ; *T. contractus*, n. sp., with fig. ; BRIART & CORNET. *T. crispicans*, n. sp., with fig. ; DE LORIO. *T. delrauzi*, n. sp., with fig. ; BRIART & CORNET. *T. derasus*, n. sp., with fig. ; DE LORIO. *T. falzanus*, n. sp., with fig. ; *T. firheti*, n. sp., with fig. ; *T. funiculosus*, n. sp., with fig. ; BRIART & CORNET. *T. gausapatus*, n. sp., with fig. ; DE LORIO. *T. ladrieri*, n. sp., with fig. ; *T. montensis*, n. sp., with fig. ; *T. pisarius*, n. sp., with fig. ; *T. quadrangulus*, n. sp., with fig. ; BRIART & CORNET. *T. minutus*, n. sp., with fig. ; SOWERBY (3). *T. puerilis*, n. sp., with fig. ; *T. richenzae*, n. sp., with fig. ; GRIEPENKERL. *T. schwelmensis*, n. sp., with figs. ; KAYSER.

TROCHIDÆ.

Trochidæ : manual of ; PILSBRY (2).

Acirsa funiculosa, n. sp., with fig. ; COSSMANN.

Aclis bouryi, n. sp., with fig. ; *id.*

Adeorbis labiosus, n. sp., with fig. ; *A. quinquecinctus*, n. sp., with figs. ; *id.*

Basilissa boutillieri, n. sp., with fig. ; *id.*

Boutilliera, n. g. ; *id.*

Calliostoma adamsi, n. sp. ; PILSBRY (2). *C. dozei*, n. sp., with fig. ; *C. senius*, n. sp. ; *C. optimum*, n. sp., with fig. ; ROCHEBEUNE & MABILE. *C. sowerbyi*, Pilsbry, = *Ziziphinus jucundus*, Sowerby ; PILSBRY (2).

Cunaticula, n. g. ; COSSMANN.

Cantharidella : new section of *Gibbula* ; PILSBRY (2).

Cantharidus pruininus, n. var. *perobtus* ; *id.* (2).

Chlorodiloma : new section of *Diloma* ; *id.* (2).

- Chlorostoma lischkei*, n. sp. ; *C. substriatum*, n. sp., with fig. ; *id.* (2).
Circulus costulatus, n. sp. ; *C. carinulatus*, n. sp. ; *C. strictus*, n. sp. ;
 LOCARD (2).
Clanculus laceyi, n. sp. ; SOWERBY (2).
Conotrochus : new section of *Gibbula* ; PILSBRY (2).
Discobasis, n. g. ; COSSMANN.
Euchelus mysticus, n. sp., with fig. ; *E. principalis*, n. sp., with fig. ;
 PILSBRY (2).
Foratiscala mesaliopsis, n. sp., with fig. ; COSSMANN.
Gibbula tryoni, n. sp., with figs. ; PILSBRY (2).
Herpetopoma : new section of *Euchelus* ; *id.* (2).
Hybochelus : new section of *Euchelus* ; *id.* (2).
Jujubinus delpretianus, n. sp., from Messina ; SULIOTTI (1).
Littoriniscala asperrima, n. sp., with fig. ; COSSMANN.
Margarita triassica, n. sp., with figs. ; WHITEAVES.
Monilea singaporensis, n. sp., with fig. ; PILSBRY (2).
Monodonta compsa, n. sp., with fig. ; COSSMANN. *M. crusoeana*, n. sp.,
 with fig. ; PILSBRY (2). *M. perplexa*, n. sp., with fig. ; *id.* (2).
Norrisia pterochilus, n. sp. ; COSSMANN.
Philbertia alleryana, n. sp., Messina ; SULIOTTI (1). *P. bofilliana*,
 n. sp. ; *id.* (2).
Photinula cauteaudi, n. sp., with fig. ; *P. detecta*, n. sp., with fig. ; *P.*
halmyris, n. sp., with fig. ; *P. hornbroni*, n. sp., with fig. ; *P. maxima*, n. sp.,
 with fig. ; *P. paradoxa*, n. sp., with fig. ; *P. pruinus*, n. sp., with fig. ; *P.*
resurrecta, n. sp., with fig. ; ROCHEBRUNE & MABILE.
Platychilus, n. g. ; *P. labiosus*, n. sp., with fig. ; COSSMANN.
Putzeysia, n. g. (type, *Trochus clathrata*) ; SULIOTTI (1). *P. clathrata* ;
id. (2).
Pyrumis promilium, n. sp., with fig. ; MEYER.
Rotella japonica, n. sp. ; SULIOTTI (2).
Rotellorbis, n. g. ; *R. lanbrierei*, n. sp., with fig. ; COSSMANN.
Solariella filosa, n. sp., with fig. ; *id.*
Tapes pollonerianus, n. sp. ; SULIOTTI (1).
Thalotia wilkiei, n. sp., with figs. ; SOWERBY.
Trochonema exile, n. sp., with fig. ; WHITFIELD.
Trochus baccatus, n. sp., with figs., Mauritius ; SOWERBY (1). *T. basi-*
levisgatus, n. sp., with fig. ; *T. carinadentatus*, n. sp., with fig. ; *T. dentu-*
lifer, n. sp., with fig. ; BRIART & CORNET. *T. fultonii*, n. sp., with fig. ;
 SOWERBY (3). *T. infundibulum* : soft parts and epipodium ; DALL (3).
T. lefevrei, n. sp., with fig. ; BRIART & CORNET. *T. lotharii*, n. sp., with
 fig. ; GRIEPENKERL. *T. raffaelli*, n. sp. ; MAYER-EYMAR (5). *T. simplici-*
lineatus, n. sp., with fig. ; BRIART & CORNET. *T. stephanensis*, n. sp.,
 with fig. ; MAYER-EYMAR (1).
Zizyphinus haliarchus, n. sp., with fig. ; MELVILL.

DELPHINULIDÆ.

- Angarima spinosa*, n. sp., with fig. ; BRIART & CORNET.
Calliophthalmus, n. g. (*Delphinulidæ*) ; COSSMANN.

Delphinula chantrei, n. sp., with fig. ; *C. ogerieni*, n. sp. ; DE LORIOI.
D. montensis, n. sp., with fig. ; *D. bicarinata*, n. sp., with fig. ; *D. helicina*,
n. sp., with fig. ; *D. crenulata*, n. sp., with fig. ; *D. funicularis*, n. sp., with
fig. ; *D. inornata*, n. sp., with fig. ; *D. globosa*, n. sp., with fig. ; *D. multi-*
lineata, n. sp., with fig. ; *D. spinosa*, n. sp., with fig. ; BRIART & CORNET.

CYCLOSTREMATIDÆ.

Cyclostrema obsoleta, n. sp., with fig. ; COSSMANN.
Leucorhynchia nitida, n. sp., with fig. ; BRIART & CORNET.
Teinostoma bilabratum, n. sp., with fig. ; *id.* *T. hosdenacense*, n. sp., with
fig. ; COSSMANN. *T. vulfinensis*, n. sp., with fig. ; DE LORIOI.

HALIOTIDÆ.

Haliotis tuberculata : sense organs, &c. ; THIELE (2).

PLEUROTOMARIIDÆ.

Ditremaria hermitei, n. sp., with fig. ; DE LORIOI.
Ecyliopterus, n. g. ; *E. regularis*, n. sp., with figs. ; *E. princeps*, n. sp.,
with figs. ; REMELÉ.
Hesperella, n. g. ; *H. minor*, n. sp., with fig. ; *H. contraria*, with fig. ;
H. limata, n. sp., with fig. ; HOLZAPFEL (2) : allied to *Pleurotomaria*.
Murchisonia gravilens, n. sp., with figs. ; *M. confusa*, n. sp., with fig. ;
WHITFIELD. *M. daryi*, n. sp., with fig. ; *M. clavacula*, with fig. ; BAR-
ROIS (1). *M. (Stegocalia) compacta*, n. sp., with figs. ; *M. (Gomostropha)*
subtilistriata, n. sp., with figs. ; *M. turriculata*, with fig., var. *scotica*, with
fig. ; DONALD.
Pleurotomaria beekmanensis, n. sp., with fig. ; WHITFIELD. *P. duponti*,
n. sp., with fig. ; HOLZAPFEL (2). *P. (Phanerotrema) cailliaudi*, n. sp.,
with fig. ; *P. subulata*, with fig. ; BARROIS (1). *P. gillieronii*, n. sp.,
with fig. ; GREPPIN. *P. charpyi*, n. sp., with fig. ; *P. guirandi*, n. sp.,
with fig. ; *P. vulfinensis*, n. sp., with fig. ; DE LORIOI (2). *P. lodanensis*,
n. sp., with fig. ; HOLZAPFEL (2).

BELLEROPHONTIDÆ.

Tubina ligeri, n. sp., with fig. ; BARROIS (1).
Bucania tripla, n. sp., with fig. ; WHITFIELD.

FISSURELLIDÆ.

Emarginula dentigera, n. sp., with fig. ; *E. pileum*, n. sp., with fig. ;
HEILPRIN (1, 2). *E. maria*, n. sp., with fig. ; COSSMANN.
Fissurella : nervous system ; BOUTAN. *F. arenicola*, n. sp. ; *F. dozei*,
n. sp., with fig. ; *F. hedeia*, n. sp., with fig. ; ROCHEBRUNE & MABILE.
F. boutillieri, n. sp., with fig. ; *F. asperrima*, n. sp., with fig. ; COSSMANN.
F. concentrica, n. sp., with fig. ; BRIART & CORNET. *F. conica*, n. sp.,

with fig. ; *F. gibbosa*, n. sp., with fig. ; GREPPIN. *F. robusta*, n. sp. ; *F. parvi-forata*, n. sp. ; SOWERBY (2).

Hercynella dubia, n. sp., with fig. ; *H. incerta*, n. sp., with fig. ; BARROIS (1).

Rimula basileensis, n. sp., with fig. ; GREPPIN. *R. etalloni*, n. sp., with fig. ; DE LORIOI (2).

Scutum clypeatum, n. sp., with fig. ; *S. semiorum*, n. sp., with fig. ; COSSMANN.

Helcion boutillieri, n. sp., with fig. ; COSSMANN. *H. simplex*, n. sp., with fig. ; BRIART & CORNET. *H. calfinensis*, n. sp., with fig. ; DE LORIOI.

Nacella compressa, n. sp., with fig. ; ROCHEBRUNE & MABILE.

Palæacmæa annulata, n. sp., with fig. ; BARROIS (1).

Patella lophophora, n. sp., with fig. ; COSSMANN. *P. metallica*, n. sp., with fig. ; ROCHEBRUNE & MABILE. *P. regularis*, n. sp., with fig. ; *P. vincenti*, n. sp., with fig. ; BRIART & CORNET.

Tryblidium acutum, n. sp., with fig. ; *T. pileolum*, n. sp., with fig. ; WHITFIELD.

COCHLOSTRINGIDÆ.

Cochlostyringia : relations to *Entocolax* ; SIMROTH (5).

Entocolax ; FISCHER ; SCHIEMENZ.

GASTEROPODS (*unclassified list*).

Aleyæus broti, n. sp., with fig. ; ALDRICH.

Charopa baldvini, n. sp. ; ANCEY (11).

Chevallieria labrosa, n. sp., with fig. ; *C. ambigua*, n. sp., with fig. ; *C. mumiola*, n. sp., with fig. ; COSSMANN.

Digoniazis bourguignati, n. sp. ; JOUSSEAUME (2).

Diplomorpha brasieri, n. sp., with fig. ; HARTMAN.

Hemiplecta dichromatica, n. sp., with fig. ; MORLET.

Lauria, with *L. minax*, n. forma., with figs. ; BËTTGER (11).

Libera heyнемanni, from Tabiti ; ANCEY (6).

Lophospira calcifera, n. sp., with figs. ; WHITFIELD.

Lytopelta : anatomy, with figs. ; SIMROTH (3).

Microlophus, n. g. ; *M. poirieri*, n. sp., with fig. ; ROCHEBRUNE & MABILE.

Micronyassia eximinia, n. sp., with fig. ; *M. giraudi*, n. sp., with fig. ; *M. singularis*, n. sp., with fig. ; *M. smithi*, n. sp., with fig. ; BOURGUIGNAT.

Nyassia callista, n. sp., with fig. ; *N. elegans*, n. sp., with fig. ; *N. giraudi*, n. sp., with fig. ; *N. idia*, n. sp., with fig. ; *N. magnifica*, n. sp., with fig. ; *N. nyassana*, n. sp., with fig. ; *N. paradoxa*, n. sp., with fig. ; *N. thaumasta*, n. sp., with fig. ; *id.*

Nyassella arenaria, n. sp., with fig. ; *N. acuminata*, n. sp., with fig. ; *N. episema*, n. sp., with fig. ; *N. formosa*, n. sp., with fig. ; *N. pulchra*,

n. sp., with fig.; *N. smithi*, n. sp., with fig.; *N. tayloriana*, n. sp., with fig.; *id.*

Nyassomelania laevigata, n. sp., with fig.; *N. leia*, n. sp., with fig.; *N. truncatelliformis*, n. sp., with fig.; *id.*

Odontoturbo delicatulum, n. sp., with fig.; DE LORIO (2).

Orbitolina: structure of shell, &c., with figs.; MARTIN (4).

Orella nebasmia, n. sp.; JOUSSEAUME (2)

Pitya hamyana, n. sp.; ANCEY (4).

Pseudamnicola raddei, n. sp., with fig.; BRETGER (4).

Pseudorarcia mirabilis, n. sp., with fig.; TATE (1).

Zingia: general anatomy; with figs.; PILSBRY (11).

POLYPLACOPHORA.

Acanthochiton conthonyi, n. sp., with fig.; ROCHEBRUNE.

Acanthopleura magellanica, n. sp.; *id.*

Chatopleura: *C. fulva*, n. sp.; *C. frigida*, n. sp., with fig.; *C. hahni*, n. sp., with fig.; *C. peruviana*, n. sp.; *P. ruripilosa*, n. sp.; *C. savatieri*, n. sp., with fig.; *id.*

Chiton baylei, n. sp., with fig.; BRIART & CORNET. *C. bernayi*, n. sp., with fig.; COSSMANN. *C. dimorphus*, n. sp., with fig.; ROCHEBRUNE. *C. rubicundus*: sense organs and nervous system; THIELE (2).

Enoplochiton rochebrunei, n. sp., with fig.; COSSMANN.

Helminthochiton lebescontei, n. sp., with fig.; BARROIS (1).

Lepidopleurus culliereti, n. sp., with fig.; *L. illuminatus*, n. sp.; *L. puniceus*, n. sp.; *L. viridulus*, n. sp.; ROCHEBRUNE.

Schizochiton hyadesi, n. sp., with fig.; *id.*

Tonicia atrata, n. sp.; *T. isabellei*, n. sp.; *T. horniana*, n. sp., with fig.; *T. lebruni*, n. sp., with fig.; *T. martiali*, n. sp., with fig.; *T. tehuelou*, n. sp.; *id.*

APLACOPHORA.

Chatodermis: anatomy; HANSEN.

Neomenia: anatomy; *id.* Sense organs: THIELE (2).

Proneomenia: anatomy; HANSEN.

SCAPHOPODA.

Dentalium montense, n. sp., with fig.; *D. hannonicum*, n. sp., with fig.; *D. magnum*, n. sp., with fig.; BRIART & CORNET.

Dentalium; *D. patagonicum*, n. sp.; *D. lebruni*, n. sp.; *D. perceptum*, n. sp.; *D. majorinum*, n. sp., with fig.; ROCHEBRUNE & MABILE.

Pulsellum neglectum, n. sp., with fig.; *P. dilatatum*, n. sp., with fig.; COSSMANN.

Siphonodentalium; *S. meyeri*, n. sp., with fig.; *S. bouryi*, n. sp., with fig.; *id.*

PELECYPODA.

Abdominal sense organs; THIELE (1). Adductor muscle, nervous system; GALEAZZI. Digestion; KRAVKOV. Parasitism; BRAUN. Tergescence; MÉNÉGAUX (1, 4). New classification based on his LANGDON. *Anomalodesmacea*: new order; DALL (8). *Prionodesma*: new order; *id.* (8). *Teleodesmacea*: new order; *id.* (8). Atracul forms; *id.* (1). *Bivalvæ* in Switzerland; SUTER. Catalogue of *Id.* forms; KEYES (1). Classification of fossil forms; GIOLI. List of taceous forms from Madagascar; NEWTON. List from Madagascar Jurassic; *id.*

OSTREIDÆ.

Alectryonia (*Ostrea*) *ungulata*, with fig.; NEWTON.

Erogyra auricularis, with fig.; *E. sp.*, with fig.; *E. lateralis*, with HEILPRIN (1).

Gryphea vesicularis, with fig.; HOLZAPFEL (1).

Ostrea at Port Darwin; SAVILE-KENT. *Ostrea*: development, with figs.; JACKSON. *Ostrea*: circulatory and respiratory organs; MÉNÉGAUX. *O. goldfussi*, n. n., = *O. carinata*, Müll., with fig.; *O. browni*, with fig.; *O. merceyi*, with fig.; *O. semiplana*, with fig.; *O. hippopodium*, with fig.; *O. armata*, with fig.; HOLZAPFEL (1). *O. cucullata*, with fig.; VIGUIER. *O. montis-caprilis*, with figs.; *O. vermicostata*, n. sp., with figs.; *O. mecostata*, n. sp., with figs.; *O. pictetiana*, with figs.; WÖHRMANN. *pedemontana*, n. sp., with fig.; MAYER-EYMAR (4). *O. ostracina*, with fig.; *O. borneensis*, n. sp., with fig.; *O. martapurensis*, n. sp., with fig.; MAYER (2). *O. serresi*: type, with fig.; VIGUIER. *O. subelmina*, n. sp., with fig.; GRIEPENKERL.

Placunopsis rothpletzi, n. sp., with figs.; WÖHRMANN.

ANOMIIDÆ.

Anomia ewaldi, with fig.; *A. incurvata*, n. sp., with fig.; HOLZAPFEL (1). *A. helvetica*, n. sp., with fig.; *A. provincialis*, n. sp., with fig.; MAYER-EYMAR (2).

Placunanomia: *P. brocchii*, with figs.; *P. margaritifera*, with figs.; *P. scarabellii*, with figs.; *P. sulcata*, with figs.; *P. varians*, n. sp., with figs.; SIMONELLI (1).

Placunopsis undulata, with fig.; HOLZAPFEL (1).

SPONDYLIDÆ.

Spondylus spinosus, with fig.; *S. dumpleanus*, with fig.; *S. latus*, with fig.; HOLZAPFEL (1).

LIMIDÆ.

L. cypris, n. sp., with fig.; *L. doris*, n. sp., with fig.; *L. p. sp.*, with fig.; *L. thisbe*, n. sp., with fig.; DE LORRON. *L. gr.*

losa, with fig. ; *L. hoperi*, with fig. ; *L. divaricata*, with fig. ; *L. cnf. muricata*, with fig. ; *L. decussata*, with fig. ; *L. oviformis*, with fig. ; *L. circularis*, n. sp., with fig. ; HOLZAPFEL (1). *L. kobyi*, n. sp., with fig. ; GREPPIN. *L. martiali*, n. sp. ; ROCHEBRUNE & MABILLE. *L. perobliqua*, n. sp., with fig. ; WHITEAVES.

PECTINIDÆ.

Hinnites bifrons, n. sp., with fig. ; SIMONELLI (2).

Pecten : circulatory and respiratory organs ; MÉNÉGAUX (6). *Pecten* : German Tertiary forms, with many figs. ; STREMMER. *P. hallensis*, n. sp., with figs. ; *P. schlosseri*, n. sp., with figs. ; WÖHRMANN. *P. (Vola) planaria*, n. sp., with fig. ; SIMONELLI (2). *P. soflariensis*, n. sp., with fig. ; *P. vischtovensis*, n. sp., with fig. ; TOULA. *P. virgatus*, with fig. ; *P. fulminifer*, n. sp., with fig. ; *P. laminosus*, with fig. ; *P. lævis*, with fig. ; *P. spatulatus*, with fig. ; *P. pulchellus*, with fig. ; *P. mantelli*, with fig. ; *P. undulatus*, with fig. ; *P. senatus*, with fig. ; HOLZAPFEL (1).

Vola quadricostata, with fig. ; *V. propinqua*, n. sp., with fig. ; *V. striatocostata*, with fig. ; *id.* (1).

AVICULIDÆ.

Actinopteria manca, with fig. ; BARROIS (1).

Avicula capensis, n. sp., with fig. ; SOWERBY (3). *A. hallensis*, n. sp., with figs. ; WÖHRMANN. *A. lima*, n. sp., with fig. ; HOLZAPFEL (2). *A. frechi*, n. sp., with fig. ; *A. lamellosa*, n. sp., with fig. ; *A. modioliformis*, with fig. ; *A. pectinoides*, with fig. ; *A. ? caudigera*, with fig. ; *A. sp. ?*, with fig. ; *id.* (1).

Cassianella sturi, n. sp., with figs. ; WÖHRMANN.

Gervillia borneensis, n. sp., with fig. ; *G. sp. indet.*, with fig. ; MARTIN (3). *G. solenoides*, with fig. ; *G. sp.*, with fig. ; HOLZAPFEL (1).

Halobia occidentalis, n. sp., with fig. ; WHITEAVES.

Inoceramus brownii, n. sp. ; CRAGIN.

Leptodesma : var. sp., with figs. ; VENYUKOVA.

Limoptera bohémica, with fig. ; BARROIS (1).

Monotis subcircularis, with fig. ; *M. ovalis*, n. sp., with fig. ; WHITEAVES.

Pinna tillonensis, n. sp., with fig. ; WILSON & CRICK (2).

Pteria corneuiliiana, with fig. ; WHITEAVES.

Pterinea striaticostata, with fig. ; BARROIS (1).

Pteroperna oolithica, n. sp., with fig. ; *P. subquadrata*, n. sp., with fig. ; GREPPIN.

MYTILIDÆ.

Crenella inflata, with fig. ; HOLZAPFEL (1).

Lithodomus valfniensis, n. sp., with fig. ; DE LORIOI (2).

Modiola hoozei, n. sp., with fig. ; MARTIN (2). *M. gigantea*, n. sp., with fig. ; *M. augasi*, n. sp., with fig. ; *M. ovata*, n. sp., with fig. ; KOBELT in Martini & Chemnitz. *M. cnf. capitata*, with fig. ; *M. radiata*, with fig. ;

M. fabacea, n. n., = *M. faba*, with fig.; HOLZAPFEL (1). *M. tenuisculpta*, n. sp., with fig.; WHITEAVES. *M. valfinensis*, n. sp., with fig.; DE LORIO.

Modiolaria petagnæ, with fig.; MEYER.

Modiolarca crassa, n. sp., with fig.; *M. lecanellieri*, n. sp., with fig.; *M. lephayi*, n. sp., with fig.; *M. savatieri*, n. sp., with fig.; *M. fuegiensis*, n. sp., with fig.; *M. sauvineti*, n. sp., with fig.; *M. hahni*, n. sp., with fig.; ROCHEBRUNE & MABILE.

Mytilus (Modiola) vulgatissimus, n. sp., with fig.; MAYER-EYMAR (1). *M. edulis*: monstrosity; VAYSSIÈRE (2). *M. infumatus*, n. sp.; *M. hupeanus*, n. sp.; ROCHEBRUNE & MABILE. *M. regiolutteranus*, n. sp., with fig.; GRIEPENKERL. *Mytilus*: revision of French species; *M. trigonus*, n. sp.; *M. pelecinus*, n. sp.; *M. glochinus*, n. sp.; *M. spathulinus*, n. sp.; *M. marioni*, n. sp.; SAYN (1).

Perna bulgarica, n. sp., with fig.; *Perna*, several new varieties, with figs.; TOULA.

Sepifer lineatus, with fig.; *S. tegulatus*, with fig.; HOLZAPFEL (1).

ARCIDÆ.

Arca aquisgranensis, with fig.; *A. gallieni*, with fig.; HOLZAPFEL (1). *A. antiopa*, n. sp., with fig.; *A. eryx*, n. sp., with fig.; *A. subterebrans*, n. sp., with fig.; DE LORIO (2). *A. noæ*: sense organs and nervous system; THIELE (2). *A. cazioti*, n. sp., with fig.; *A. fontannesi*, n. sp., with fig.; MAYER-EYMAR (4). *A. sabinæ*, n. sp., with fig.; MORLET. *A. sororcula*, n. sp., with fig.; MAYER-EYMAR (4).

Cardiola minuta, with fig.; BARROIS (1).

Cucullacea subglabra, with fig.; *C. matheroniana*, with fig.; *C. rugosa*, n. sp., with fig.; *C. mülleri*, n. sp., with fig.; *C. sp.?*; HOLZAPFEL (1).

Felicia, n. g.: *F. jouseumi*, n. sp., with fig.; ROCHEBRUNE & MABILE.

Limopsis hönigshausi, with fig.; *L. mülleri*, n. sp., with fig.; HOLZAPFEL (1). *Limopsis hirtella*, n. sp.; ROCHEBRUNE & MABILE.

Pectunculus crebreliratus, n. sp., with fig., Australia; SOWERBY (1). *P. geinitzii*, with fig.; HOLZAPFEL (1).

Trigonocelia galeata, with fig.; *id.* (1).

NUCULIDÆ.

Leda fürsteri, with fig.; HOLZAPFEL (1). *L. orangica*, n. sp., with fig.; ROCHEBRUNE & MABILE. *L. tirolensis*, n. sp., with figs.; WÖHRMANN.

Malletia hyadesi, n. sp., with fig.; *M. patagonica*, n. sp.; ROCHEBRUNE & MABILE.

Nucula nucleus: gills and heart; MÉNÉGAUX. *N. pulvellus*, with fig.; *N. tenera*, with fig.; HOLZAPFEL. *N. savatieri*, n. sp., with fig.; ROCHEBRUNE & MABILE. *N. telleri*, n. sp., with figs.; WÖHRMANN.

MODIOLOPSIDÆ.

Modiomorpha submissa, with fig.; BARROIS (1).

TRIGONIIDÆ.

Myophoria, various species, with figs. ; *M. sublaevigata*, n. sp. ; FRECH.
M. fissidentata, n. sp., with figs. ; WÖHRMANN.

Remondii ferrissii, n. sp. ; CRAGIN. *R. minor*, n. sp. ; SMITH (4). *R. tanganyicense* ; *id.* (4).

Trigonidæ : genealogy ; FRECH.

Gruenewaldia, n. g. ; *G. decussata*, with figs. ; WÖHRMANN.

Trigonia mæstrichtiana, n. sp., with fig. ; *T. ciplana*, n. sp., with fig. ; BRIART. *T. vaalsiensis*, with figs. ; HOLZAPFEL (1). *T. valfinensis*, n. sp., with fig. ; DE LORIOI.

UNIONIDÆ.

Anodonta : dissection : STUMP. *A. fluviatilis* ; PEYSTER. *A. cygnea* : tumour ; WILLIAMS (6). *A. piscinalis* ; DE FOLIN (1). *A. species* from Rhone ; *A. amnica*, with fig. ; *A. conrexa*, with fig. ; *A. dorsuosa*, with fig. ; *A. cygnea*, with fig. ; *A. formosa*, with fig. ; *A. littoralis*, with fig. ; *A. tremula*, with fig. ; DROUET.

Margaritana : catalogue and description ; LOCARD (3).

Najida : post-embryonal development ; BRAUN (1).

Pseudodon ovalis, n. sp., with fig. ; MORLET.

Unio : catalogue and descriptions ; LOCARD (3).

Leguminaia craverii, n. sp. ; *L. pedemontana*, n. sp. ; POLLONERA (4).

Unio complanatus in Michigan ; WALKER. *U. moriscottei*, n. sp., with fig. ; DE FOLIN (2).

Unionidæ : descriptions of species from Rhone, with figs. ; DROUET.

Unio : species from Rhone ; *U. badiellus*, with fig. ; *U. charpyi*, with fig. ; *U. crassulus*, with fig. ; *U. cristulatus*, with fig. ; *U. lacustria*, with fig. ; *U. redactus*, with fig. ; *U. suborbicularis*, with fig. ; *id.*

Unionidæ : origin of, with many figures ; NEUMAYR.

Unio dautzenbergi, n. sp., with fig. ; *U. semi-decoratus*, n. sp., with fig. ; *U. siamensis*, n. sp., with fig. ; *U. sutrungensis*, n. sp., with fig. ; MORLET.

CARDINIIDÆ.

Trigonodus productus, n. sp., with fig. ; WHITEAVES.

Guerangeria davousti, with fig. ; BARROIS.

CARDITIDÆ.

Chenocardiola, n. g. ; *C. haliotoidea*, with fig. ; HOLZAPFEL (2).

Cardita hoozei, n. sp., with fig. ; MARTIN (2). *C. sandæ*, n. sp., with fig. ; MAYER-EYMAR (4). *C. transiens*, n. sp., with fig. ; *id.* (1). *C. guirandi*, n. sp., with fig. ; DE LORIOI. *C. bohémica*, n. sp., with fig. ; GRIEPENKERL.

Carditella subradiata, n. sp., with fig. ; TATE (2).

Myoconcha discrepans, with fig. ; HOLZAPFEL (1). *M. minima*, n. sp., with fig. ; GREPPIN.

Venericardia benedeni, with fig. ; HOLZAPFEL (1).

ASTARTIDÆ.

Astarte (?) *baroni*, n. sp., with figs. ; NEWTON. *A. carlottensis*, n. sp. ; WHITEAVES. *A. elongata*, n. sp., with fig. ; *A. pulchella*, n. sp., with fig. ; *A. trapeziformis*, n. sp., with fig. ; GREPPIN. *A. martapurensis*, n. sp., with fig. ; MARTIN (2). *A. orbicularior*, n. sp., with fig. ; MEYER. *A. pisonæ*, n. sp., with fig. ; *A. thevenini*, n. sp., with fig. ; *A. valfinensis*, n. sp., with fig. ; DE LORIOI. *A. similis*, with fig. ; HOLZAPFEL (1). *A. urnovuna*, n. sp., with fig. ; TOULA.

Astartopsis, n. g. ; *A. stur*, with fig. ; WÖHRMANN.

Eriphyla lenticularis, with fig. ; HOLZAPFEL (1).

Mecynodon: zoological position ; *M. eifeliensis*, n. sp., with figs. ; FRECH.

Myophoriopsis, n. g. ; *M. lineata*, with fig. ; WÖHRMANN.

Opis valfinensis, n. sp., with fig. ; DE LORIOI. *O. ungula*, n. sp., with fig. ; GRIEPENKERL.

CRASSATELLIDÆ.

Crassatella acuminata, n. sp., with fig. ; SOWERBY (3). *C. arcacea*, with fig. ; *C. subarcacea*, with fig. ; *C. æqualis*, n. sp., with fig. ; HOLZAPFEL (1). *C. borneensis*, n. sp., with fig. ; MARTIN (2). *C. japonica*, n. sp., with fig., Japan ; SOWERBY (1). *C. proteus*, n. sp., with fig. ; MARTIN (2).

EBYCINIDÆ.

Kellia rostellata, n. sp., with fig. ; TATE (2).

Montacuta capensis, n. sp., with fig. ; SOWERBY (3). *M. semiradiata*, n. sp., with fig. ; TATE (2).

CARDIIDÆ.

Cardium cazecæ, n. sp., with fig. ; *C. tschaudæ*, n. sp., with fig. ; ANDRUSSEN. *C. djaricaneux*, n. sp., with fig. ; MARTIN (2). *C. edule*: variations ; BATESON. *C. erugatum*, n. sp., with fig. ; TATE (2). *C. kansasense*, n. sp. ; CRAGIN. *C. medulicum*, n. sp., with fig. ; MAYER-EYMAR (1). *C. mösianum*, n. sp., with fig. ; TOULA. *C. nöggerathi*, with fig. ; *C. becksii*, with fig. ; *C. semipustulosum*, with fig. ; *C. pectiniforme*, with fig. ; HOLZAPFEL (1). *C. zetes*, n. sp., with fig. ; DE LORIOI.

Conocardium bohemicum, var. *longula*, with fig. ; *id.* var. *depressa*, with fig. ; *C. quadrans*, with fig. ; *C. marsia*, with fig. ; *C. nucella*, with fig. ; *C. øhlerti*, n. sp., with fig. ; *C. reflexum*, with fig. ; *C. vexatum*, with fig. ; BARROIS (1).

Granocardium productum, with fig. ; *G. marquarti*, with fig. ; HOLZAPFEL (1).

Lophocardium fischeri ; DALL (4).

Myophoricardium, n. g. : *M. lineatum*, n. sp. ; WÖHRMANN.

Unicardium josephensi, n. sp., with fig. ; DE LORIOI (2).

CHAMIDÆ.

Diceras : *D. bourgeati*, n. sp., with fig. ; *D. guiraudi*, n. sp., with fig. ; DE LORIO.

Chama bifrons, n. sp., with fig. ; GRIEPENKERL. *C. bermudensis*, n. sp., with fig. ; HEILPRIN (1, 2). *C. rotunda*, n. sp., *C. albida*, n. sp., *C. küsteriana*, n. sp., all with figs. ; CLESSIN, in Martini & Chemnitz. *C. incrassata*, n. sp., with fig. ; MAYER-EYMAR (4). *Chama* : figs. of many species and of *C. compacta*, n. sp. : *C. bülowiana*, n. sp. ; *C. oblonga*, n. sp. ; *C. reereana*, n. sp. ; *C. parrula*, n. sp. ; *C. granulata*, n. sp. ; *C. truncata*, n. sp. ; *C. lamarckiana* ; *C. maculata* ; *C. flavida*, n. sp. ; *C. porosa*, n. sp. ; *C. lana*, n. sp. ; CLESSIN, in Martini & Chemnitz.

Rudista : fossils from chalk of Borneo ; MARTIN (1).

Rudistes : affinities of, p. 461 ; DALL (8). *Rudistes* from Inferior Cretaceous, 2 pls. ; DOUVILLÉ.

Horiopleura : var. species, with figs. ; *id.*

Polyconites verneuilli, with figs. ; *id.*

Radiolites cantabricus, n. sp., with figs. ; *id.*

Toucasia seunesi, n. sp. : *V. santanderensis*, n. sp., with figs. ; *id.*

MEGALODONTIDÆ.

Megalodon ; BOEHM.

Megalodus compressus, n. sp., with fig. ; WÖHRMANN.

Durga ; BOEHM.

CYPRINIDÆ.

Cyprina mordax, n. sp., with fig. ; MARTIN (2). *C. oolithica*, n. sp., with fig. ; GREPPIN. *C. yukonensis*, n. sp., with fig. ; WHITEAVES.

Cyprocardia trapezina, n. sp., with fig. ; HOLZAPFEL (1).

Isocardia zitteli, n. sp., with fig. ; *id.* (1).

Venilicardia var. *Reyi*, with fig. : *id.* (1).

VENERIDÆ.

Cyprimeria geinitzii, with fig. ; *C. moneta*, n. sp., with fig. ; HOLZAPFEL (1).

Cytherea assahanensis, n. sp., with fig. ; MARTIN (2). *C. arenionensis*, n. sp., with fig. ; MAYER-EYMAR (4). *C. communis* ; *id.* (1), *C. penistoni*, n. sp., with fig. ; HEILPRIN (1, 2). *C. prorincialis*, n. sp., with fig. ; DEPÉRET. *C. tumida*, with fig. ; *C. ovalis*, with fig. ; *C. plana*, with fig. ; *C. polymorpha*, with fig. ; HOLZAPFEL (1).

Ptychomya indica, n. sp., with fig. ; MARTIN (2).

Types faba, with fig. : *T. fragilis*, with fig. ; *T. nuciformis*, with fig. ; HOLZAPFEL (1). *T. oligocenica*, n. sp., with figs. ; DEPÉRET.

Venerupis iridescens, n. sp., with figs. ; TATE (2).

Venus fontannesi, n. sp., with figs. ; DEPÉRET. *V. philippii*, n. sp., with fig. ; MAYER-EYMAR (2). *V. preclathrata*, n. sp., with fig. ; DEPÉRET.

CYRENIDÆ.

Cyrena livracensis, n. sp., with fig. ; MAYER-EYMAR (1).

Cyrenidæ ; CARPENTER (1).

Sphærium (Limosina)ingleyi, n. sp., with figs. ; PILSBRY (8).

UNGULINIDÆ.

Mysia pellucida, n. sp., with fig. ; HEILPRIN (2).

DONACIDÆ.

Donax mediterranean, sp. ; MONTEROSATO (2). *D. addolii*, n. sp., with fig. ; *D. brevior*, n. sp., with fig. ; MAYER-EYMAR (3).

PSAMMOBIIDÆ.

Psammobia fischeri, n. sp., with fig. ; MAYER-EYMAR (3).

Psammotettina capensis, n. sp. ; SOWERBY (2).

Sanguinolaria antarctica, n. sp. ; ROCHEBRUNE & MABILE.

SOLENIIDÆ.

Ensis belgica, n. sp., with fig. ; HOLZAPFEL.

Novaculina siamensis, n. sp., with fig. ; MORLET.

Solen poirieri, n. sp. ; ROCHEBRUNE & MABILE.

MACTRIDÆ.

Lutraria græffei, n. sp., with fig. ; *L. pæтели*, n. sp., with fig. ; MAYER-EYMAR (3).

Mactra debyana, with fig. ; *M. bosquetiana*, with fig. ; HOLZAPFEL (1). *M. jousseaumi*, n. sp. ; ROCHEBRUNE & MABILE. *M. matthewsi*, n. sp., with fig. ; TATE (2).

Raeta meridionalis, n. sp., with fig. ; *id.* (2).

MYIDÆ.

Corbula substriatulace, fig. ; *C. brisseli*, n. sp., with fig. ; *C. lineata*, with fig. ; HOLZAPFEL (1). *Corbula*, sp. indet., with fig. ; MARTIN (3). *C. retro-sulcata*, n. sp., with fig. ; DEPÉRET.

Mya arenaria : byssal stage in young ; RYDER (1).

GLYCIMERIDÆ.

Glycimeris geinitzii, n. nom., = *Panopea regularis*, Gein, with fig. ; *G.*, sp., with fig. ; HOLZAPFEL (1).

Saxicava frigida, n. sp. ; *S. lebruni*, n. sp. ; *S. mollis*, n. sp. ; ROCHEBRUNE & MABILE.

GASTROCHÆNIDÆ.

Gastrochæna americana, with fig.; *G. amphischæna*, with fig.; HOLZAPFEL (1). *G. curta*, n. sp., with fig.; MAYER-EYMAR (4). *G. flora*, n. sp., with fig.; DE LORIOI.

PHOLADIDÆ.

Pholas costatus: general anatomy; DALL (2). *P. dactylus*: contraction and light; DUBOIS (1, 2, 3); siphon; *id.* *P. reticulata*, with fig.; *Pholas* (?), n. sp., with fig.; HOLZAPFEL (1).

Zirphæa crispata: general anatomy; DALL (2).

TEREDINIDÆ.

Teredo: morphology; MÉNÉGAUX (2, 3, 5). *T. fragilis*, n. sp., with fig.; TATE (2). *T. granulata*, n. sp., with fig.; *T. voracissima*, with fig.; HOLZAPFEL (1).

LUCINIDÆ.

Lucina: turgescence and structure of gills; MÉNÉGAUX (8). *L. bæhmi*, n. sp., with fig.; *L. clytia*, n. sp., with fig.; *L. girardotti*, n. sp., with fig.; *L. nysa*, n. sp., with fig.; DE LORIOI. *L. lævigata*, n. sp., with fig.; *L. rhomboidalis*, n. sp., with fig.; GREPPIN. *L. liracula*, n. sp., with fig.; SOWERBY (3). *L. subulpina*, n. sp.; MAYER-EYMAR (5). *L. subnummissalis*, with fig.; *L. æquensis*, n. sp., with fig.; HOLZAPFEL (1).

Paracyclas lebescontei, n. sp., with fig.; BARROIS (1).

Sphæra madagascarensis, n. sp., with figs.; NEWTON.

Calyculina lacustris, var. *rotundata*, with figs.; LIENENKLAUS.

TELLINIDÆ.

Corbis guirandi, n. sp., with fig.; *C. valfinensis*, n. sp., with fig.; DE LORIOI.

Linearea valfinensis, n. sp. (?), with fig.; *id.*

Macoma eborea, n. sp., with fig.; HEILPRIN (2).

Tellina bellardii, n. sp., with fig.; MAYER-EYMAR (1). *T. orbicularis*, n. sp.; SOWERBY (2). *T. ponsonbyi*, n. sp., with fig.; *id.* (3). *T. strigata*, with fig.; *T. renauxii*, with fig.; *T. costulata*, with fig.; *T. mulleri*, n. nom., = *Cupsa gigantea*, Müll., with fig.; HOLZAPFEL (1).

SCROBICULARIIDÆ.

Semele (?) *virginiana*, n. sp., with fig.; MEYER.

CUSPIDARIIDÆ.

Cuspidaria; DALL (7).

Cuspidaria (*Cardiomya*) *greeni*, n. sp., with fig.; SMITH (7).

Neæra acutissima, with fig. ; HOLZAPFEL (1).

Tropidophora stumpfi, n. sp. ; *T. undatolirata*, n. sp. ; BETTGER (3).

SOLENOMYIDÆ.

Solemya macrodactyla, n. sp. ; ROCHEBRUNE & MABILE.

PANDORIDÆ.

Cælodon patulus, n. sp., with fig. ; TATE (2).

Pandora difissa, n. sp. ; ROCHEBRUNE & MABILE.

VERTICORDIIDÆ.

Lyonsiella gemma, with fig. ; SMITH (7).

CEROMYIDÆ.

Ceromya cretacea, with fig. ; HOLZAPFEL (1).

Goniomya designata, with fig. ; *id.* (1).

ARCOMYIDÆ.

Cercomya papyracea, with fig. ; HOLZAPFEL (1).

ANATINIDÆ.

Thracia capensis, n. sp., with fig. ; SOWERBY (3).

Poromya obtusa, with fig. ; HOLZAPFEL (1).

PHOLADOMYIDÆ.

Aviculomya, n. g. ; *A. peralata*, n. sp., with fig., allied to *Pholadomya*, HOLZAPFEL (2).

Pholadomya, n. sp., with fig. ; TOULA. *P. decussata*, with fig. *esmarki*, with fig. ; *P. nodulifera*, with fig. ; HOLZAPFEL (1). *P. suni*, n. sp., with fig. ; MARTIN (2). *P. thyrræna*, n. sp., with fig. ; SIMON (2).

Pholadomyocardia jelskii, n. g. & sp., with figs. : SZAJNOCHE.

CLAVAGELLIDÆ.

Clavagella elegans, with fig. ; HOLZAPFEL (1). *C. minima*, n. sp., figs., from Mauritius ; SOWERBY (1).

PELECYPODA.

INCERTÆ SEDIS.

Cypricardinia *costata*, with fig. : *C. gratiosa*, with fig. : BARROU.

(Unclassified List.)

- Ephippodonta*, n. g.; *E. mcdougalli*, n. sp., with fig.; TATE (2).
Fordilla in *Olenellus* fauna; WALCOTT (2).
Gyropleura cipyana, with fig.; *C. laevis*, n. sp., with fig.; HOLZAPFEL (1).
Modioloides prisca in *Olenellus* fauna; WALCOTT (2).
Boulairia gigantea, n. sp., with fig.; MARTIN (2).

IV.—REFERENCES. SYSTEMATIC CLASSIFICATION.

GENERAL ANATOMY.

Mollusca; SCHIEMENZ (1). *Mollusca*, with 15 pls.; VAYSSIÈRE (1). *Mollusca* peculiar to Australia; TENISON-WOODS. *Mollusca* of deep sea; PELSENER (2). *Bivalves*; MÉNÉGAUX (1). *Aerope*; PILSBRY (11). *Ampullaria georgii*, n. sp.; WILLIAMS (7). *Caloria*; TRINCHESE. *Chaetoderma*; HANSEN. *Cione*; SCHALFEJEFF. *Gonatus fabricii*; HOYLE (1). *Lytopelta*; SIMROTH (3). *Melapium*; SMITH (1). *Neomenia*; HANSEN. *Nudibranchiata*; BERGH (2). *Parmacella*; SIMROTH (3). *Pholas*; DALL (2). *Proneomenia*; HANSEN. *Sepia*: sexual and specific differences; LAGATU. *Slugs*; SIMROTH (3, 4). *Teredo*; MÉNÉGAUX (2). *Testacella*; POLLONERA (2). *Thersites*; HEDLEY (2). *Trochus infundibulum*; DALL (3). *Vaginula*; SIMROTH (1). *Zirphea*; DALL (2). *Zingis*; PILSBRY (11).

INTEGUMENT, SKELETON, AND MUSCLES.

Byssus in *Mya*; RYDER (1, 2). Cephalic cartilages in *Gonatus*; HOYLE (1). Foot in *Lobiger*; SMITH (2A). Muscular impressions in *Nautilus* and *Celonautilus*; FOORD & CRICK. Siphon in *Marginella*; BOUVIER (1). Siphon and funnel in *Nautilus*; BROOKS. Spinous sacs in Cephalopods; PELSENER (4).

SHELL.

French Malacology; LOCARD (5). Summer studies; KEEP. Shell not a mere secretion; DALL (8). *Ammonites*: suture lines; BUCKMAN (1). Silurian Cephalopods: Shell; DEWITZ. *Gonatus fabricii*: pen; HOYLE (1). *Helix mitanensis*; GODWIN-AUSTEN (1). Lamellibranchs: Hinge; LANGDON. *Orbitolina*, with sections; MARTIN (4). *Robillardia*; SMITH (2). *Rudistes*; DOUVILLÉ. *Unionidæ*; NEUMAYR.

ALIMENTARY CANAL.

Aneitea, with fig.; HEDLEY (1). *Gonatus fabricii*; HOYLE (1). *Melapium*, with fig. of Odontophore; SMITH (1). Radula in *Aerope*;

PILSBRY (11). *Radula* in *Cypresides*; MALARD. *Radula* in *Rhipidoglossate Mollusca*; PILSBRY (9). *Dendronotus arborescens*: hepatic *cæca*; HERDMAN & CLUBB.

PHYSIOLOGY.

Absorption of iron by *Mollusca*; SCHNEIDER. Death by drowning in *Helix*; WILLIAMS (10). *Lamellibranchs*: digestion; KRAVKOV. Fluid emitted by *Limnea stagnalis*; WILLIAMS (14). Glycogen in *Mollusca*; *id.* (11). Muscle contraction in *Mollusca*; *id.* (12). Siphon of *Pholas*; DUBOIS (1, 2, 3). Excretory organs in *Cytherea*; LETELLIER (3).

RESPIRATION.

Lamellibranchiata without gills; DALL (1). *Lamellibranchiata*: gills; MÉNÉGAUX (10). *Lucina*: gills; *id.* (8). *Nucula nucleus*: gills; *id.* (9). *Ostrea*: gills; *id.* (7). *Pecten jacobæus* and *P. maximus*: gills; *id.* (6).

CIRCULATION.

Amœboid cells of *Mollusca*; CATTANEO. *Aplysia*: organs of circulation; RIVIÈRE (2). *Nucula nucleus*: organs of circulation; MÉNÉGAUX (9). *Ostrea*: organs of circulation; *id.* (7). *Pecten jacobæus*: organs of circulation; *id.* (6). *P. maximus*: organs of circulation; *id.* (6).

NERVOUS SYSTEM.

Mollusca; HALLER. *Mollusca*: homologies in other groups; THIELE (2). *Cephalopoda*: nerve supply of arms; JATTA (2). *Gasteropoda*: nervous system as a basis of classification; PELSENER (6). *Lamellibranchs*: nerves in adductors; GALEAZZI. *Prosobranchiata*: nervous system; BROCK (1). *Fisurella*: nervous system; BOUTON. *Gonatus fabricii*: nervous system; HOYLE (1). *Vaginula*: nervous system; SIMROTH (1).

SENSE ORGANS.

Lamellibranchiata; THIELE (1). Lateral line system in *Mollusca*; *id.* (2). Heteropod eye; GRENACHER. Osphradium in *Mollusca*; PELSENER (3).

EXCRETORY ORGANS.

Mollusca; KOWALEVSKY. *Pulmonata*; BEHME. *Prosobranchiata*; PERRIER. *Acalepha*; LETELLIER (1). *Clione limacina*; SCHALFEJÉFF. *Cytherea*; LETELLIER (3). *Gonatus fabricii*; HOYLE (1).

GLANDS.

Branchial glands and their secretion; MAZARELLI (2). Purple producing cells in *Purpura capillus*; LETELLIER (2). Lymphatic glands; CUVÉNOT. glands in integument; SIMROTH (1).

GENITALIA.

Ancista, with fig. ; HEDLEY (1). *Aplysia* ; MAZZARELLI (1, 3), RIVIÈRE (3), ROBERT, SAINT-LOUP. *Arion* : various species, with figs. ; POLLONERA (1). *Helix* : various species, with figs. ; HEDLEY (1, 2, 3). *Helices* : descent of ova ; PÉREZ. *Pulmonata* ; BROCK (2). *Sepia* : sexual characters in the shell ; LAGATU. *Valvata* : with woodcuts ; GARNAULT (2).

EMBRYOLOGY.

Mollusca : many references and comparisons with Annelid stages ; ROULE. *Ampullaria* : ovum and development ; RYDER (3). *Loligo* : cleavage phenomena ; WATASE. *Helix* and *Arion* : impregnation ; GARNAULT (1). *Najade* ; BRAUN (1). *Ostræa* : development ; JACKSON. *Pallifera* ; VON JHERING. *Philomycus* ; *id.* *Pulmonata* : development of genitalia ; BROCK (2). *Pulmonata* : development of urinary system ; BEHME. *Sepia* : modified epithelium in embryo ; HOYLE (2). *Unionidae* : parasitic stages ; BRAUN (5).

STRAY BIOLOGICAL NOTES.

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FRANCE.—*Circulus* species; LOCARD (2). Species of *Margaritana* and *Unio*; *id.* (3). Monograph of *Valvata*; *id.* (4). Somme: *Mollusca*; BRET. Brest: *Mollusca*; BAVAR, DANIEL. Chaine - des - Maures; FLE. Auxonne: WATTESBLED? Allier: ANGLAIR. Rhone; DROUET.

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AUSTRO - HUNGARY. — *Bythinella* ; BRANSIK. *Gasteropoda* ; SZÉP. Kärnten : Land Shells ; GALLENSTEIN (2).

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7. Malagasy Region.

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INDIA.—*Gasteropods* ; THEOBALD.

ANNAM.—*Mollusca* ; CROSSE & FISCHER.

SIAM.—Catalogue of Shells ; MORLET.

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AUSTRO-POLYNESIAN REGION.—New Hebrides : new Shells ; HARTMAN. NEW CALEDONIA : new *Gasteropods* ; EUTHYME. Louisiade Archipelago : SMITH (6).

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S. AUSTRALIA.—TATE (2).

Transatlantic Province.

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- Tertiary and Diluvium : *Pupa* genus ; BËTTGER (11).
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 Australia : *Gasteropods* ; TATE (1, 5).
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 SIMONELLI (1).
 Oligocene : *Mollusca* ; VON KOENEN. *Argile rupeliennne* : Shell fauna ;
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 Miocene of America : list of *Mollusca* ; MEYER : *Mitrida*, with new
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- Cretaceous of Aachen : *Mollusca* ; HOLZAPFEL (1). Cretaceous of
 Brunswick : *Mollusca* ; GRIEPENKERL. Cretaceous of Tournay : *Mol-
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 taceous of Bohemia : *Mollusca* ; FRIČ.
 Upper Cretaceous : *Trigonia* ; BRIART.
 Greensand of Crimea, with list of fossils ; KARAKASCH.
 Lower Cretaceous.—Speeton Clay : fossils ; LAMPLUGH.
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- Jurassic Clays : *Mollusca* ; ROBERTS, T., DE LORIOL. *Ammonites* ;
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 Inferior Oolite : British *Ammonites* ; BUCKMAN (2). British *Gastero-
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 Lias of Tilton : lists of fossils ; WILSON & CRICK (1, 2).

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Triassic of Canada : *Mollusca* ; WHITEAVES. Balkans : *Mollusca* ;
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Muschelkalk : *Cephalopoda* ; WAGNER.

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Carboniferous Chalk : *Cephalopoda* ; HOLZAPFEL (2).

Lower Carboniferous of Iowa : *Gasteropods* ; KEYES (2, 3).

DEVONIAN.

Calcaire d'Erbray, with lists of fossils ; BARROIS (1).

Devonian of Finistère, with lists of fossils ; *id.* (2). Devonian of
Svinord ; VENYUKOVA.

CAMBRIAN.

Cambrian fossils ; WALCOTT (1).

Lower Cambrian : fauna of *Olenellus* beds ; *id.* (2).

BRACHIOPODA.

BY

OSWALD H. LATTER, M.A.

I.—LIST OF PUBLICATIONS.

1. BARROIS, C. Faune du Calcaire d'Erbray (Loire Inf.). *Brachiopoda*. Mém. Soc. Lille (4) xvii, pp. 60–153, pls. iv–x.

The *Brachiopoda* are very abundant; new species of *Strophomena* (1), *Orthis* (3), *Rhynchonella* (2), *Meristella* (3), *Athyris* (3), *Spirifer* (2), *Centronella* ? (3), *Cryptonella* ? (1), *Crania* (1), are described and figured.

2. BERGERON, T. Geologie du Rouergue et de la Montagne Noire. *Rhynchonella bisouensis*, Berg. Ann. Sci. géol. xxii, p. 346, pl. v, fig. 9.

3. BITTNER, A. Ein neuer Fundort von Brachiopoden des Hallstätter Kalkes auf dem Nasskör bei Neuberg an der Mürz und die Hallstätter Brachiopoden von Mühltahl bei Feisting. Verh. geol. Reichsanst. 1889, No. 7, pp. 145–147.

Contains a list, without descriptions, of the species found at the two localities; many new and amended species are mentioned, of which several have been more fully described previously elsewhere.

4. —. Revision der Brachiopoden von Set Cussian. *Op. cit.* 1889, No. 8, pp. 159–170.

The Brachiopod fauna consists of—*Terebratula*, 11–12 species; *Waldheimia*, 5 species; *Thecidium*, 6–7 species; *Thecospira*, 1 species; *Spiriferina*, 11 species; *Cyrtina*, 2 species; *Spirigera*, 14–15 species; *Retsia*, 9–10 species; *Koninckina*, 2 species; *Koninckella*, 2 species; *Amphidina*, 3 species; *Rhynchonella*, 11–12 species; *Discina* (incl. *Crania* ?) 2 species. The following new names are given:—*Terebratula cassiona*, n. n. (for *T. vulgaris minor*, Münst., *T. indistincta*, Laube); *T. neglecta*, n. n. (for *T. sturi*, Laube); *T. capsella*, n. n. (for *Waldheimia subaugusta*, Münst.), 6 new species are mentioned. *Waldheimia* (Aul.) *porrecta*, n. n. *Thecospira zugmayeri*, n. n. (for *Th. lachesis*, Laube), and 2 new species. *Thecidium discors*, n. n. (for *Cyrtina buchii*, Klipst.). *Spiriferina*, 2 new species.

2 Brach.

BRACHIOPODA.

Cyrtina zittelii, n. n. (for *C. buchii*, Klipst.). *Spirigera*, 1 new species. *Retzia laubei*, n. n. (for *R. lyrata*, Münst.); *R. klipsteinii*, n. n. (for *R. procerrima*, Klipst.), with 2 new species. *Koninckina*, *Koninckella*, and *Amphiclina*, 1 new species each. *Rhynchonella pichleri*, n. n. (for *Spirigera oppelii*, Laube); *Rh. cornaliana*, n. n. (for *Rh. depressa cornalia*), and 3 new species.

5. CARUS, J. V. *Brachiotomata (Molluscoidea). Brachiopoda. Prodr. Faunæ Mediterraneæ*, II, i, pp. 54-61.

A list of Mediterranean species, with special and general distribution, definitions, and synonymy.

6. DALL, W. H. A Preliminary Catalogue of the Shell-bearing Marine Molluscs and Brachiopods of the South-Eastern coast of the United States (with illustrations). *Bull. U. S. Nat. Mus.* xxxvii. *Brachiopoda*, pp. 28-31.

A table is given, with reference to plates, general and special distribution, and in space and time.

7. ECKSTEIN, K. *Repetitorium der Zoologie. Leipzig: 8vo. Brachiopoda*, p. 158.

8. ETHERIDGE, R. [JUNR.]. Remarks on Fossils of Permo-Carboniferous Age, from N.W. Australia, in the Macleay Museum. *Brachiopoda. P. Linn. Soc. N.S.W.* iv, 2, pp. 203 & 208-211, pl. xvii.

Athyris macleayana, n. sp., and *Cyrtina carbonaria*, var. *australasica*, n. var., are described and figured.

9. FRIČ, A. Studien im Gebiete der Böhmischen Kreide-formation. Paläontologische Untersuchungen der einzelnen Schichten. iv. Die Teplitzer Schichten *Brachiopoda*. *Arch. naturw. Landesforsch. Böhmen.* vii, 2, pp. 56 & 87-89, figs. 87-91.

On p. 56 is given a table of the geological distribution of the 6 species found; on pp. 87-89 short descriptions and figures.

9A. GEINITZ, F. E. Die Kreidesgeschiebe des Mecklenbürgischen Diluviums. *Brachiopoden. Z. geol. Ges.* xl, p. 742.

10. GREFFIN, E. Description de la Grande Oolithe des Environs de Bâle. *Brachiopodes. Mém. Soc. Pal. Suisse*, xv, pp. 130-132.

2 species of *Rhynchonella* and 3 of *Terebratula* are found.

11. HOYLE, W. E. On the Deep-water Fauna of the Clyde Sea-Area. *Brachiopoda. J. L. S.* xx, No. 123, pp. 452 & 453.

12. KUNISCH, DR. Über die Versteinerungsformen der *Terebratula vulgaris*. *J. Ber. schles. Ges.* lxvi, pp. 101 & 102.

13. MARTIN, K. Die Fauna der Kreideformation von Martapoera. *Samm. Geol. Mus. Leid.* Nos. 18, 19, iv, 5, 6, pp. 126-196. *Brachiopoda*, pp. 148-150, pl. xv, figs. 1-6.

A new species of *Terebratula* (*Terebratella*?) is described, p. 149.

14. MILLER, S. A. North American Geology and Palæontology. Cincinnati, Ohio : 1889. *Brachiopoda*, pp. 330-388, figs. 532-640.
Contains an alphabetical list of genera and species.
15. NEUMAYR, M. Die Stämme des Thierreichs. Wirbellose Thiere i. Wien & Prag : 1889. Cap. 6. Molluskoidea. Brachiopoden, pp. 520-576, figs. 158-192.
A general account of the group, from a phylogenetic standpoint. A classification is given, pp. 573-576.
16. TOLL, E. v. Die paläozoischen Versteinerungen der Neusibirischen Insel Kotelnj. Mém. Ac. Pétersb. xxxvii, 3. *Brachiopoda*, pp. 14-38, pls. i & ii.
2 new varieties and 1 new species of *Orthis* are described, 1 new *Rhynchonella*, and 1 new *Camarophoria*. Also pp. 35-38, pls. ii & iii, 1 new species of *Orthis*, and of *Rhynchonella*.
17. ULRICH, E. O. On *Lingulasma*, a New Genus, and Eight New Species of *Lingula* and *Trematis*. Am. Geol. iii, 1889, pp. 377-391, with woodcut, and iv, 1889, pp. 21-25.
It is suggested that *Lingula granulata*, Phillips, *L. tenuigranulata*, McCoy, and *L. canadensis*, Billings, will prove to belong to *Lingulasma*, n. g.
18. VENYUKOFF, P. Faune devonskikh' otlozhenij Svinorda (Fauna of the Devonian near Svinord). Trudui St. Petersburg Nat. xx, pp. 1-23, pl. i (sect. de Géol. et de Mineralogie).
Contains descriptions and figures of 2 new species of *Lingula*.
19. WALCOTT, C. D. Description of New Genera and Species of Fossils from the Middle Cambrian. P. U. S. Nat. Mus. xi, pp. 441 & 442.
New species of *Lingulella*, *Crania*, *Orthisina*, and a new variety of *Acrotreta gemma* are described.
20. WHITEAVES, J. F. On some Fossils from the Hamilton Formation of Ontario, with a List of Species at present known from that formation and province. Contributions to Canadian Palæontology (Geol. & Nat. Hist. Survey of Canada). Vol. i. *Brachiopoda*, pp. 111-116, 123, & 124, pl. xv.
The strata are of Middle Devonian age ; a new species of *Lingula* and of *Spirifera* are described and figured.
21. —. On some Fossils from the Triassic Rocks of British Columbia. Contributions to Canadian Palæontology (Geol. & Nat. Hist. Survey of Canada). Vol. i. *Brachiopoda*, pp. 128-131, pl. xvii.
A new *Spiriferina* and a new *Terebratula* are described.
22. —. On some Cretaceous Fossils from British Columbia, the North-West Territory, and Manitoba. *Op. cit.* Vol. i. *Brachiopoda*, p. 169, pl. xxi, figs. 3 & 3a, and pp. 163 & 164, pl. xxii, figs. 1 & 2, & p. 185.
A new *Discina* is described, and a new *Terebratula*.

II.—SUBJECT INDEX TO LIST OF PUBLICATIONS.

DISTRIBUTION.

America. MILLER (14), WALCOTT (19), DALL (6).

Canada. WHITEAVES (20, 21, 22).

Mediterranean. CARUS (5).

Bohemia. FRIČ (9).

Australia. ETHERIDGE (8).

Clyde Area. HOYLE (11).

PHYLOGENY.

NEUMAYR (15).

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BERGERON (2), BITTNER (4), MILLER (14), NEUMAYR (15), ULRICH (17).

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Cretaceous. BARROIS (1), BITTNER (3), GEINITZ (9A), FRIČ (9), MARTIN (13), WHITEAVES (22), GREPPIN (10).

Triassic. WHITEAVES (21).

III.—SYSTEMATIC.

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Lingula procteri, n. sp., p. 377 ; *L. bisulcata*, n. sp., p. 380 ; *L. whitfeldi*, n. sp., p. 381 ; *L. modesta*, n. sp., p. 382 ; ULRICH (17).

Lingula lewinsonii, n. sp., p. 3 ; *L. amalitzkii*, n. sp., p. 4 ; VENYUKOFF (18).

Lingula theldfordensis, n. sp., p. 111 ; WHITEAVES (20).

Lingulasma, n. g., p. 383 ; *L. schucherti*, n. sp., p. 389 ; ULRICH (17).

Lingulella mcconnelli, n. sp., p. 141 ; WALCOTT (19).

DISCINIDÆ.

Discina pileolus, n. sp., p. 159 ; WHITEAVES (22).

CRANIADÆ.

Crania occidentalis, n. sp., p. 153 ; BARROIS (1).

Crania (?) *columbiana*, n. sp., p. 141 ; WALCOTT (19).

Trematis fragilis, n. sp., p. 21 ; *T. crassipuncta*, n. sp., p. 22 ; *T. umbo-nata*, n. sp., p. 23 ; *T. oblata*, n. sp., p. 23 ; ULRICH (17).

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Orthis bungei, n. sp., p. 18 ; *O. macfarlanei*, var. *elliptica*, n. var., p. 19 ; *O. iowensis*, var. *quadrangularis*, n. var., p. 19 ; *O. arctica*, n. sp., p. 35 ; TOLL (16).

Orthis bureau, n. sp., p. 74 ; *O. deperdita*, p. 75 ; *O. cyrtinoidea*, n. sp., p. 76 ; BARROIS (1).

Strophomenoides, Zugm., n. sp. ; BITTNER (3).

Strophomena hercynica, n. sp., p. 65 ; BARROIS (1).

Orthisina alberta, n. sp., p. 442 ; WALCOTT (19).

SPIRIFERIDÆ.

Athyris dubia, n. sp., p. 116 ; *A. gibbosa*, n. sp., p. 118 ; *A. erbrayi*, n. sp., p. 119 ; BARROIS (1).

Athyris macleayana, n. sp., p. 208 ; ETHERIDGE (8).

Retsia preciosa, n. sp. ; BITTNER (3).

Retsia laubei, n. n., p. 167 ; *R. klipsteinii*, n. n., p. 167 ; *R. münsteri*, n. sp., p. 168 ; *R. ladina*, n. sp., p. 168 ; *id.* (4).

Meristella recta, n. sp., p. 107 ; *M. lata*, n. sp., p. 108 ; *M. biplicata*, n. sp., p. 109 ; BARROIS (1).

Spirifer subsulcatus, n. sp., p. 129 ; *S. subcabedanus*, n. sp., p. 138 ; *id.* (1).

Spirifera münsteri, n. sp., p. 167 ; BITTNER (4).

Spirifera subdecussata, n. sp., p. 114 ; WHITEAVES (20).

Spiriferina klipsteini, n. sp., p. 164 ; *S. frondescens*, n. sp., p. 164 ; *S. venustula*, n. sp., p. 164 ; *S. tyrolensis*, n. sp., p. 164 ; *S. badiotica*, n. sp., p. 164 ; BITTNER (4).

Spiriferina borealis, n. sp., p. 128 ; WHITEAVES (21).

Cyrtina carbonaria, McCoy, var. *australasia*, n. var., p. 210 ; ETHERIDGE (8).

Cyrtina zittelii, n. n., p. 164 ; BITTNER (4).

KONINCKIDÆ.

Koninckina elegantula, Zugm., n. sp. ; BITTNER (3).

Koninckina oligocæla, n. sp., p. 168 ; *K. fastigata*, n. sp., p. 168 ; *id.* (4).

Amphiclina laubei, n. sp., p. 168 ; *id.* (4).

Amphiclina hersteinensis, n. sp. (?).

Amphiclinodonta zugmayeri, n. sp. ; *A. amphitoma*, Zugm., n. sp. ; *A. crassula*, Zugm., n. sp. ; *id.* (3).

RHYNCHONELLIDÆ.

Rhynchonella amalthoides, n. sp., p. 82 ; *R. (Wilsonia) bureausi*, n. sp., p. 98 ; BARROIS (1).

Rhynchonella javanica, n. sp. ; *R. notabilis*, n. sp., var. *sagittalis* ; *R. intermixta*, n. sp. ; *R. kittlii*, n. sp. ; *R. geyeri*, n. sp. ; *R. superba*, n. sp. ; BITTNER (3).

Rhynchonella pickleri, n. n., p. 169 ; *R. cornaliana*, n. n., p. 169 ; *R. lingulata*, n. sp., p. 169 ; *R. blaasi*, n. sp., p. 169 ; *R. sublata*, n. sp., p. 169 ; *id.* (4).

Rhynchonella, n. sp., pp. 22 & 36 ; TOLL (16).

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Terebratula (Terebratella) borneensis, n. sp., p. 149 ; MARTIN (13).

Terebratula liardensis, n. sp., p. 130 ; WHITEAVES (21).

Terebratula robusta, n. sp., p. 163 ; *id.* (22).

Waldheimia porrecta, n. n., p. 161 ; BITTNER (4).

Waldheimia pulchella, n. sp. ; *W. reascendens*, n. sp. ; *id.* (3).

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Cryptonella (?) *caillaudi*, n. sp., p. 149 ; *id.* (1).

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Thecidium discors, n. n., p. 163 ; *T. gryphecum*, n. sp., p. 163 ; *T. asperulatum*, n. sp., p. 163 ; BITTNER (4).

Thecospira zugmayeri, n. n., p. 163 ; *id.* (4).

POLYZOA.

BY

OSWALD H. LATTER, M.A.

I.—LIST OF PUBLICATIONS.

1. BARROIS, C. Faune du Calcaire d'Erbray (Loire Inf.). Bryozoaires. Mém. Soc. Lille (4) xvii, pp. 57-59.
2. BENHAM, W. B. The Anatomy of *Phoronis australis*. Q. J. Micr. Sci. xxx, 2, pp. 125-158, pls. x-xiii; also J. R. Micr. Soc. 1889, 6, pp. 740 & 741.

The author describes the anatomy of *P. australis*; gives brief definitions of the 5 species included in the genus, and discusses the relation of *Phoronis* to *Brachiopoda*, *Polyzoa*, and Sipunculids. There is no close resemblance between *Phoronis* and the *Brachiopoda*, and the relation to Sipunculids is nearer than to the *Polyzoa*.

3. BRAEM, F. Über die Statoblastenbildung bei *Plumatella*. Zool. Anz. 1889, No. 299, pp. 64 & 65; also J. R. Micr. Soc. 1889, 3, p. 377.

4. —. Die Entwicklung der Bryozoen-colonie im keimenden Statoblasten. Zool. Anz. 1889, No. 324, pp. 675-679, with woodcut.

Description of the phenomena in the development of *Cristatella* and *Plumatella*.

5. CARUS, J. F. *Brachiostomata (Molluscoidea)*. Bryozoa (*Polyzoa*). Prodr. Faunæ Mediterraneæ, 11, i, pp. 1-54.

A classified list of Mediterranean species, giving special and general distribution, definitions, and synonymy.

6. DENDY, A. On the anatomy of an Arenaceous Polyzoan. P. R. Soc. Vict. 1889, i (n.s.), pp. 1-12, pls. i-iii; also J. R. Micr. Soc. 1889, 4, pp. 499 & 500.

Describes a new genus (*Cryptozoon*) with 2 new species, related to *Bowerbankia*. Abundant particles of sand are agglomerated on to the zoecia.

7. ECKSTEIN, K. Repetitorium der Zoologie. Leipzig: 8vo. *Bryozoa*, p. 158.

8. FEWKES, J. W. A Preliminary Notice of a Stalked Bryozoon (*Ascorhiza occidentalis*). Ann. N. H. iii, 1889, pp. 1-6, pl. i; also Q. J. Micr. Soc. 1889, 2, p. 201.

Description of this form, for which a new genus must be constituted, found off the coast of California. *Incertæ sedis*.

9. FICKERT, C. Beiträge zur Fauna der Umgebung von Tübingen. *Alcyonella* (*Plumatella*) *fungosa*. JH. Ver. Württ. xlv, 1889, p. 364.

10. FRIČ, A. Studien im Gebiete der Böhmischen Kreideformation. Paläontologische Untersuchungen der einzelnen Schichten. iv. Die Teplitzer Schichten. *Bryozoa*. Arch. naturw. landesforsch. Böhmen, vii, 2, pp. 57, 89, & 90, figs. 92-97.

On p. 57 is given the geological distribution of the 6 species found; on pp. 89-90, short descriptions and drawings.

11. GRIEG, J. A. Undersøgelser over dyrelivet i de vestlandske fjorde. II. *Polyzoa*. Bergens Mus. Aarsber. 1888 (pub. 1889), No. 2, p. 9.

12. HINCKS, T. The *Polyzoa* of the S. Lawrence: a Study of Arctic Forms. Ann. N. H. iii, 1889, pp. 424-433, pl. xxi.

Genus *Rhamphostomella*, Lorenz, is revised. A new *Mucronella* is described and figured.

13. HOYLE, W. E. On the Deep-water Fauna of the Clyde Sea-Area. *Polyzoa*. J. L. S. xx, No. 123, pp. 452-455.

14. KIRKPATRICK, H. Report of a Deep-sea Trawling Cruise off the S.W. coast of Ireland, under the direction of Rev. W. Spotswood Green. *Polyzoa*, &c. Ann. N. H. iv, 1889, p. 446.

Contains merely a list of species captured.

15. KUNSTLER, J. *Cristatella mucedo*. J. Microgr. xii, 1888, pp. 73-79.

An account of the organisation and methods employed in preparation. The statoblasts are parthenogenetic ova, which remain attached for the greater part of their development to the funiculus.

16. LOMAS, J. Note on the structure of *Alyconidium gelatinosum*. P. Liverp. Biol. Soc. i, 1887, pp. 29-33, pl. iii.

Spicules are present, indicating that Ctenostomatous forms are derived from forms possessing a calcareous ectocyst.

17. —. Report on the *Polyzoa* of Puffin Island. *Op. cit.* ii, 1888, pp. 74-77.

52 species are recorded, including a new variety of *Bagula turbinata*.

18. —. Second Report on the *Polyzoa* of the L. M. B. C. District. *Op. cit.* iii, pp. 214-224, and 3 woodcuts.

Total number of species is 109. A list is appended with tabular statement of special distribution.

19. MACMUNN, C. A. Contributions to Animal Chromatology. *Polyzoa*. Q. J. Micr. Sci. xxx, pt. 2, pp. 77-79, pl. vi; also J. Mar. Biol. Ass. (n.s.) i, March, 1889, pp. 59 & 60.

The colouring matter of *Lepralia foliacea* and of *Flustra foliacea* is described.

20. MCCOY, F. Natural History of Victoria. *Polyzoa*. Prodr. Zool. Vict. xviii, pp. 270-291, pls. clxxv-clxxviii; and xix, pp. 307-323, pls. clxxv-clxxxvii.

21. MILLER, S. A. North American Geology and Palæontology. Cincinnati, Ohio: 1889. *Molluscoida* (*Bryozoa*), pp. 289-330, figs. 448-531.

Contains alphabetical list of genera and species. Diagnoses of *Orepipora* (Ulrich), n. g., *C. simulans*, n. sp.; *Cycloporella*, n. g.; *Dichotrypa*, n. g. (Ulrich); *Diploclema*, n. g. (Ulrich); *Eurydictya*, n. g. (Ulrich), syn. for *Phanopora*; *Euspilopora*, n. g. (Ulrich), syn. for *Stictopora*; *Fistulipora astricta*, n. sp. (Ulrich), fig. only, *F. foordi*, n. sp. (Ulrich), fig. only; *Goniotrypa*, n. g. (Ulrich), syn. (?) for *Coscinium*; *G. bilateralis*, n. sp. (Ulrich); *Meekopora*, n. g. (Ulrich), *M. clausa*, fig. only; *Nematopora*, n. g. (Ulrich); *Nicholsonella*, n. g. (Ulrich); *Petalotrypa*, n. g. (Ulrich); *Phacelopora*, n. g. (Ulrich); *Pinacotrypa*, n. g. (Ulrich); *Protocrisina*, n. g. (Ulrich); *Prontella*, n. g. (Ulrich); *Ptilotrypa*, n. g. (Ulrich); *Sphragiopora*, n. g. (Ulrich); *Streblotrypa*, n. g. (Ulrich); *Strotopora*, n. g. (Ulrich); *Tæniotrypa*, n. g. (Ulrich), *T. cingulata*, n. sp. (Ulrich), fig. only; *Worthenopora*, n. g. (Ulrich).

22. NEUMAYR, M. Die Stämme des Thierreichs. Wirbellose Thiere 1. Wien & Prag: 1889. Cap. 6. Molluskoidea. *Bryozoa*, pp. 513-519, figs. 154-164.

23. PERGENS, E. Untersuchungen an Seebryozoen. Zool. Anz. 1889, No. 317, pp. 504-510; and No. 318, pp. 526-533.

The first part is concerned mainly with general anatomy, especially of the "pores"; the second mainly with embryological phenomena.

24. —. Deux nouveaux types de Bryozoaires Cténostomes. Ann. Soc. Mal. Belg. 1888 (pub. 1889) xxiii, pp. 340-343, pl. xiv.

Establishes 2 new genera: *Benedenipora* and *Lobiancopora*, each with 1 new species.

25. PROUHO, H. Sur la structure et la métamorphose de la *Flustrella hispida* (Bryzoaire cténostome). C.R. cviii, 1889, pp. 1023-1025; also J. R. Micr. Soc. 1889, 4, p. 501.

A mesoblastic cellular layer particularly developed in the aboral region is described for the first time.

26. —. Sur la reproduction de quelques Bryozoaires cténostomes. C.R. cix, 1889, pp. 197 & 198; also J. R. Micr. Soc. 1889, 5, pp. 629 & 630.

27. [PROUHO, H.] On the Reproduction of some Ctenostomatous *Bryozoa*. Ann. N. H. iv, 1889, pp. 407 & 408.

This note is mainly concerned with the "intertentacular organ" of two species of *Alcyonidium*, one of which, *A. duplex*, is new to science. The organ in question serves for the discharge of ova.

28. ROULE, L. Sur une nouvelle espèce méditerranéenne du genre *Phoronis*. C.R. cix, pp. 195 & 196.

The new species is named *P. sabatieri*.

29. SAUVAGE, H. E. Note sur les Bryozoaires jurassiques de Boulogne. Bull. Soc. géol. (3) xvii, i & ii, pp. 38-52, pls. iii & iv.

The author gives a list of the *Polyzoa* found in these strata, and describes of *Stomatopora* 2 new species, and of *Rosacilla* 3 new species.

30. SCHNEIDER, R. Ueber Eisen-Resorption in thierischen Organen und Geweben. Abh. Ak. Berl. 1888 (Phys. Abh. ii), *Vermes*, p. 12.

Under this heading are described experiments on *Alcyonella benedeni* and *Oriostatella mucedo*.

31. SEELIGER, O. Die ungeschlechtliche Vermehrung der endoprokten Bryozoen. Z. wiss. Zool. xlix, i, pp. 168-208, pls. ix & x, 6 woodcuts.

The paper treats of (1) the formation of the Bryozoan stock; (2) the budding from the free ends of the stolon; (3) the branching of the stolon, and formation of new buds between the old; (4) the regeneration of the *Pedicellina*-heads; (5) general observations on asexual reproduction.

32. SHALER, N. S. Geology of the Island of Nantucket. [*Bryozoa*.] Bull. U. S. Geol. Surv. No. 53, pp. 36 & 37.

33. VINE, G. R. Notes on the Classification of the Palæozoic *Polyzoa*. P. York. Geol. Polyt. Soc. xi, i, pp. 20-44.

The author discusses (1) the nomenclature of the elements of the zoarium, (2) the limits of the class *Polyzoa*.

34. VINE, G. R. A monograph of Yorkshire Carboniferous and Permian *Polyzoa*. Part I. T. c. pp. 68-85, pls. iii & iv.

35. WALFORD, E. A. On some *Polyzoa* from the Inferior Oolite of Shipton Gorge, Dorset. Ann. N. H. iii, 1889, p. 440.

36. WATERS, A. W. On some Ovicells of Cyclostomatous *Bryozoa*. J. L. S. xx, No. 121, pp. 275-280, pl. xiv.

The ovicells of *Hornera fissurata*, Busk, *Idmonea meneghini*, Heller, *Idmonea irregularis*, Meneghini, and *Idmonea milncana*, d'Orb., are described.

37. —. On the Ovicells of some *Lichenopore*. T. c. pp. 280-285, pl. xv.

The author describes the ovicells of *L. californica*, Busk, *L. echinata*, MacG., *L. victoriensis*, n. n. (*Disoporella reticulata*, MacG.), and *Disco-subigera*? *lineata*, MacG.

38. [WATERS, A. W.] *Bryozoa* from New South Wales. Ann. N. H. iv, 1889, pp. 1-24, pls. i-iii.

3 new species of the genus *Schizoporella* and 1 new variety are described, also 3 new species of *Smittia*.

39. —. Supplementary Report on the *Polyzoa* collected by H.M.S. 'Challenger' during the years 1873-1876. Challenger Reports, xxxi, pt. lxxix, pp. 1-41, pls. i-iii.

For the most part a revision of Busk's Report. 1 new variety of *Cellepora* and of *Membranipora* is described, 1 *Farciminaria*, 1 *Flustra*, 1 *Porina*. Busk's determinations are frequently set aside, e.g.,—*Menipea clausa*, Busk = *Scrupocellaria marsupiat*, Jullien, Waters. *Calymmophora lucida*, Busk = *Urceolipora nana*, MacGillivray, Waters. *Vincularia gothica*, Busk = *Thalamoporella steganoporoides*, Goldstein, Waters.

40. WHITEAVES, J. F. On some Fossils from the Hamilton formation of Ontario, with a list of species at present known from that formation and province. Contributions to Canadian Palæontology (Geol. & Nat. Hist. Survey of Canada). Vol. i. *Polyzoa*, pp. 122 & 123.

II.—SUBJECT INDEX TO LIST OF PUBLICATIONS.

DISTRIBUTION.

- Mediterranean. ROULE (28), CARUS (5).
 France. SAUVAGE (29), BARROIS (1).
 England. (Dorset) WALFORD (35), (Liverpool District) LOMAS (18), (Clyde) HOYLE (13).
 Germany. (Tübingen) FICKERT (9).
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 Scandinavia. GRIEG (11).
 America. MILLER (21), FEWKES (8).
 Australia. WATERS (38), DENDY (6), M'Coy (20).

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GENERAL ANATOMY.

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- PROUHO (27).
 (Statoblasts.) Parthenogenetic ova of *Cristatella*; KUNSTLER (15).

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- Budding of *Entoprocta*; SEELIGER (31).
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 Marine *Polyzoa* generally; PERGENS (23). *Flustrella*; PROUHO (26).

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Jurassic ; SAUVAGE (29).
Cretaceous ; FRIČ (10), BARROIS (1).

III.—SYSTEMATIC CLASSIFICATION.

Discussion of ; VINE (33).

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Phoronis sabatieri, n. sp. ; ROULE (28).

EUPOLYZOA.

GYMNOLEMATA.

CYCLOSTOMATA.

PTILODICTYONIDÆ.

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Fistulipora astricta, n. sp. (Ulrich), fig. 276 ; *F. foordi*, n. sp. (Ulrich),
fig. 477.
Goniotrypa, n. g. (Ulrich), p. 307, syn. for *Coscinium* ; *G. bilateralis*,
n. sp. (Ulrich), p. 307.
Eurydictya, n. g. (Ulrich), p. 301, syn. for *Phænopora*. MILLER (21).

TUBULIPORIDÆ.

Stomatopora morinica, n. sp., p. 41 ; *S. rigauxi*, n. sp., p. 42.
Rosacilla alaudi, n. sp., p. 46 ; *R. corallina*, n. sp., p. 47 ; *R. boloniensis*,
n. sp., p. 48. SAUVAGE (29).

LICHENOPORIDÆ.

Lichenopora victoriensis, n. n. ; WATERS (37).

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Crepipora, n. g. (Ulrich), p. 299 ; *C. simulans*, n. sp. (Ulrich), fig. 268.
Cycloporella, n. g., p. 299. *Dichotrypa*, n. g. (Ulrich), p. 300. *Diploclema*,
n. g. (Ulrich), p. 300. *Meekeporella*, n. g. (Ulrich), p. 312 ; *M. clausa*, n. sp.
(Ulrich), fig. 494. *Nematopora*, n. g. (Ulrich), p. 313. *Nicholsonella*, n. g.

(Ulrich), p. 313. *Petalotrypa*, n. g. (Ulrich), p. 314. *Phacelopora*, n. g. (Ulrich), p. 314. *Pinacotrypa*, n. g. (Ulrich), p. 315. *Protocrisina*, n. g. (Ulrich), p. 317. *Prontella*, n. g. (Ulrich), p. 318. *Ptilotrypa*, n. g. (Ulrich), p. 320. *Strotopora*, n. g. (Ulrich), p. 326. *Teniodictya*, n. g. (Ulrich), p. 327; *T. cingulata*, n. sp. (Ulrich), fig. 526. *Sphragiopora*, n. g. (Ulrich), p. 323. *Streblotrypa*, n. g. (Ulrich), p. 325. MILLER (21).
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CTENOSTOMATA.

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Lobiancopora, n. g.; *L. hyalina*, n. sp., p. 342; *id.* (24).
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PORINIDÆ.

Porina proboscidea, n. sp., p. 39; WATERS (39).

MICROPORELLIDÆ.

Thalamoporella steganoporoides (Goldstein) = *Vincularia gothica* (Busk); WATERS (39).

MYRIOZOIDÆ.

Schizoporella challengeria, n. n. (*Myrizooum inerme*, Busk), p. 30; WATERS (39).

Myrizooum immersum = *Schizoporella challengeria* (Busk).

Schizoporella subimmersa, n. var., p. 11; *S. ambita*, n. sp., p. 11; *S. lævigata*, n. sp., p. 11; *S. sidneyensis*, n. sp., p. 12.

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Retepora avicularis (MacGilliv.) = *R. jacksonensis* (Busk); WATERS (39).

CELLARIIDÆ.

Cellaria australis (MacGilliv.) = *Salicornaria clavata* (Busk). *C. rigida* (MacGilliv.) = *S. simplex* (Busk). WATERS (39).

POLYZOA.

CELLULARIIDÆ.

Scrupocellaria marsupitata (Jullien) = *Menipea clausa* (Busk); WATERS (39).

ESCHARIDÆ.

Urceolipora nana (MacGilliv.) = *Calymnophora lucida* (Busk); WATERS (39).

Gen. *Rhamphostomella*, Lorenz, revised, p. 425; HINCKS (12).

Mucronella spinulifera, n. sp., p. 431; HINCKS (12).

Mucronella delicatula = *Smittia delicatula* (Busk). *M. castanea* = *Lepralia castanea* (Busk).

Escharoides oclusa = *Lepralia oclusa* (Busk). WATERS (39).

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Ascorhiza, n. g., *A. occidentalis*, n. sp., California; FEWKES (8).

CRUSTACEA.

BY

CECIL WARBURTON, B.A.

I.—LIST OF PUBLICATIONS.*

- ADLERZ, G. Bidrag till Pantopodernas Morfologi och Utvecklings-historia. Bih. Sv. Ak. Handl. iv, xiii, No. 11, 25 pp., 2 pls.
- AURIVILLIUS, C. W. S. Die Maskirung der oxyrrhynchen Decapoden durch besondere Anpassungen ihres Körperbaues vermittelt. Eine biologisch-morphologische Studie. Sv. Ak. Handl. xxiii, No. 4, 72 pp., 5 pls. Stockholm: 1889, 4to.
- BATE, C. SPENCE. On a new Genus of *Macrura* (*Ophthalmeryon transitionalis*). Ann. N. H. (6) iv, pp. 67-76, 1 pl.
- BATESON, W. Senses and Habits of *Crustacea*. J. Mar. Biol. Ass. i, pp. 211-214. Abstr. in J. R. Micr. Soc. 1889, p. 748.
- BEDDARD, F. E. On the possible Origin of the Malpighian Tubules in the *Arthropoda*. Ann. N. H. (6) iv, pp. 290-292. Abstr. in J. R. Micr. Soc. 1889, p. 742.
- BERGENDAL, D. (1) Neue Beobachtungen über die Formvariation der ersten abdominalen Anhänge bei Krebsweibchen. Bih. Sv. Ak. Handl. xv, No. 5, 15 pp., separately. Stockholm: 1889, 8vo. [See Zool. Rec. xxv, *Crust.*, BERGENDAL.]
- . (2) Abstract of his paper on Male copulatory organs in female Crayfish. J. R. Micr. Soc. 1889, p. 53. [See Zool. Rec. xxv, *Crust.*, BERGENDAL (2).]
- BIGOT, A. Note sur les Homalonotus des grès siluriens de Normandie. Bull. Soc. géol. (3) xvi, pp. 419-435, 3 pls.
- BOAS, J. E. V. (1) Kleinere carcinologische Mittheilungen. (2) Ueber den ungleichen Entwicklungsgang der Salzwasser- und der Süßwasserform von *Palæmonetes varians*. Zool. Jahrb. (Abth. f. Syst.) iv, pp. 793-884.

* An asterisk prefixed to a quotation signifies that the Recorder has not seen the Journal or Work referred to.

- [BOAS, J. E. V.] (2) Om de forakjellige Udvikling hos Salt-og Ferskvandsformen af *Palaemonetes varians*. Vid. Medd. 1889, pp. 48-56.
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— (2) Ein neuer *Podon* [*schmackeri*] aus China nebst Bemerkungen zur Synonymie der bisher bekannten *Podon*-Arten. *Abb. Ver. Brem.* x, pp. 295-300.

— (3) Notizen zur Fauna der Süßwasser-Becken des nordwestlichen Deutschland mit besonderer Berücksichtigung der *Crustaceen*. *T. c.* pp. 517-552, 1 pl.

POUCHET, G. Sur un nouveau *Cyamus* (*physeteria*) parasite du Cachalot. *C.R.* cvii, pp. 698 & 699. *Trans.* in *Ann. N. H.* (6) ii, p. 511.

REMELÉ, Ad. Richtigstellung einer auf die Phacopiden-Species *Homalops altumi*, Rem., bezüglichen Angabe. *Z. geol. Ges.* xi, pp. 586 & 587.

RENAUT, C. Note sur une Eryonidée nouvelle trouvée à St. Honorine-la-Guillaume (Orne) dans le Grès liasique [*Eryon morierei*, n. sp.]. *Bull. Soc. L. Norm.* (4) ii, pp. 13-19, 2 pls.

RICHARD, J. (1) Description du *Mesochra blanchardi*, Copépode nouveau des Sebkas Algériennes. *Bull. Soc. Z. Fr.* xiv, pp. 317-321.

— (2) Anomalie de l'antenne droite chez *Diaptomus caeruleus*, Fisch., male. *T. c.* pp. 38 & 39.

ROSSIJSKAJA, M. Abstract of her second paper on the Development of *Amphipoda*. *J. R. Micr. Soc.* 1889, p. 510. [See *Zool. Rec.* xxv, *Crust.*, ROSSIJSKAJA (3).]

ROSSOLL, A. Abstract of his paper on two new Copepods parasitic on Echinoderms. *T. c.* p. 54. [See *Zool. Rec.* xxv, *Crust.*]

ROULE, L. Sur l'évolution initiale des Feuilletts Blastodermiques chez les Crustacés Isopodes (*Asellus aquaticus*, L., and *Porcellio scaber*, Latr.). *C.R.* cix, pp. 78 & 79. *Abstr.* in *J. R. Micr. Soc.* 1889, p. 639.

DE ROUVILLE. Le genre *Amphion* (Pander), à Cabrières (Hérault). *Op. cit.* cviii, pp. 470 & 471.

SAFFORD, J. M., & VOGDES, A. W. Description of new species of fossil *Crustacean* from the Lower Silurian of Tennessee, with remarks on others not well known. *P. Ac. Philad.* 1889, pp. 166-168, 3 cuts.

- SARS, G. O. (1) Bidrag til Kundskaben om Decapodernes Forvandleringer. 11. *Lithodes*, *Eupagurus*, *Spiropagurus*, *Galathodes*, *Galathea*, *Munida*, *Porcellana* (*Nephrops*). Arch. f. math. og Naturv. 1888, pp. 133-201, 7 pls. Also separately.
- (2) On some Freshwater *Ostracoda* and *Copepoda* raised from Dried Australian Mud. Christiania (Dybwad): 1889, 8vo. [From Christiania Vid.-Selsk. Forhlg. 1889, No. 8] 79 pp., 8 pls.
- (3) On a small Collection of Freshwater *Entomostraca* from Sydney. Christiania (Dybwad): 1889, 8vo. [From Christiania Vid.-Selsk. Forhlg. 1889, No. 9] 9 pp.
- SCHIMKEWITSCH, W. M. (1) Ob odnom sluchaye vnyeshnyagho hermaphrodisma u ryechnagho raka. [On a kind of external hermaphroditism in the freshwater Crayfish.] Trudui St. Petersburg Nat. (Zool.) xx, pp. 64 & 65.
- (2) Nablyudeniya nad faunoi Byelagho Mora. 2. *Enteropsis dubius*. 3. Zamyetka o razvitii paraziticheskikh *Copepoda*. [White Sea Fauna. 3. Development of parasitic *Copepoda*.] St. Petersburg: 1889, 8vo, 137 pp., 5 pls.
- SCHMEIL, O. Ueber den *Diaptomus* des Salzigen Sees (*Diaptomus richardi*, n. sp.). Zool. Anz. xii, pp. 647-649.
- He gives the points which distinguish it from allied species.
- *SCHMIDT, F. Ob *Olenellus mickwitzii*. Trudui St. Petersburg Nat. (Géol.), xx, pp. x & xi.
- SÉRIZAT, —. Études sur Tébessa et ses environs. Bull. Ac. Hippone, xxii.
- A few Crustacea on p. 271.
- SCOTT, T. Notes on a few Crustacea and Mollusca new to the Fauna of the Forth. P. Phys. Soc. Edinb. x, pp. 154-156.
- 5 Crustacea, 2 Mollusca.
- SHERBORN, C. D. Notes on the Fossil *Ostracoda*. P. Tr. Croydon Nat. Hist. Club, 1888-89, pp. 162-166.
- A general account of the group. Nothing new.
- *SOKOLOV, W. Zamyetka o *Macrocheira kempferi*. [Development of *M. k.*] Trudui Kharkoff Univ. xv, pp. i-iii.
- *STAMATI, G. Monstrosity in a Crayfish. Bull. Soc. Zool. Fr. xiii, pp. 199-201. Abstr. in J. R. Micr. Soc. 1889, p. 213.
- STOSSICH, M. Sopra alcuni Lavori Carcinologici del Dr. Alfredo Giard. Boll. Soc. Adr. xi, pp. 31-35.
- THOMPSON, J. C. (1) *Copepoda*, new to Britain, found in Liverpool Bay. P. Liverp. Biol. Soc. i, pp. 34-39, 3 pls.
- (2) Report on the *Copepoda* collected in Maltese Seas, by David Bruce, during 1886-88. *Op. cit.* ii, pp. 137-151, 4 pls.
- (3) Third Report on the *Copepoda* of Liverpool Bay. *Op. cit.* iii, pp. 181-194, 2 pls.

THOMPSON, B. The Upper Lias of Northamptonshire. J. Northampt. Soc. v, June 1888, pp. 54-81.

Short list of *Crustacea* on p. 82.

TORSENT, E. Quelques mots sur *Paratanais forcipatus*, Lilljeb., et *Tritacta gibbosa*, Böeck. Bull. Soc. L. Norm. (4) ii, pp. 11-13.

VILLEPOIX, B. M. DE. Contribution à l'étude de la Faune des Eaux Douces de la vallée de la Somme. (Copépodes et Cladocères.) Amiens (Delattre-Leuvel) : 1889, 8vo, 23 pp.

VOSSELER, J. (1) Die Copepoden fauna der Eifelmeere. Arch. f. Nat. iv, pp. 117-124. Transl. in Ann. N. H. (6) iv, pp. 293-300, 1 pl.

— (2) Amphipoden und Isopoden von Spitzbergen. Arch. f. Nat. 55th Jahrg., vol. i, pp. 151-162, 1 pl.

Being a portion of Kükenthal's Beiträge zur Fauna Spitzbergens. T. c. pp. 125-168.

WALKER, A. O. (1) Report on some *Crustacea* from the Canary Islands, collected by Messrs. I. C. Thompson and W. S. McMillan. P. Liverp. Biol. Soc. ii, pp. 130-132.

— (2) Report on the *Crustacea* of Liverpool Bay. T. c. pp. 171-181, 1 pl.

— (3) Third Report on the Higher *Crustacea* of the L. M. B. C. District (Liverpool). Op. cit. iii, pp. 195-213, 2 pls.

WALTER, A. Transkaspische Binnencrustaceen. II. Malacostraca. Zool. Jahrb. (Abth. f. Syst.) iv, pp. 1110-1123.

WEISMANN, A., & ISCHIKAWA, C. Ueber die Paracopulation in Daphniden-Ei, sowie über Reifung und Befruchtung desselben. T. c. (Abth. f. Anat.) iv, pp. 155-196, 7 pls.

WELDON, W. F. R. (1) Function of Spines of Crustacean *Zoeæ*. J. Mar. Biol. Ass. i, p. 169, 1 pl. Abstr. in J. R. Micr. Soc. 1889, p. 748.

— (2) Cœlom and Nephridia of *Palaemon serratus*. T. c. pp. 162-168. Abstr. in J. R. Micr. Soc. 1889, p. 749.

WELTNER, W. Ueber das Vorkommen von *Bythotrephes longimanus*, Leyd., und *Dendrocelum punctatum*, Pall, in dem Werbellinsee bei Berlin. SB. nat. Fr. ix, pp. 171-177.

WHITFIELD, R. P. Description of a new Balanoid Cirripede fossil from the Marcellus shale of New York. Bull. Am. Mus. Nat. Hist. ii, pp. 66-68.

WHIDBORNE, G. F. On some Devonian Crustaceans. Rep. Brit. Ass. lviii, p. 681.

WIERZEJSKI, A. O niektórych pasorzytach raka rzeczucero (Parasites of the Freshwater Cray-fish). Krakau : 1888, 8vo, 20 pp., 1 pl.

WRZĘSNIOWSKI, L. O trzech Kielzach podziemnych (Three Subterranean *Amphipoda*). Pam. Fizjogr. viii, pp. 221-330, 11 pls.

A long paper, with a history of the subject (pp. 224-250), the rest systematic.

ZACHARIAS, O. Bericht über eine zoologische Exkursion an die Kraterseen der Eifel. Biol. Centralbl. ix, pp. 56-59 & 76-79.

A few *Crustacea* on pp. 58 & 77.

ZIETZ, A. Descriptions of New Species of South Australian Crustaceans. Tr. R. Soc. S. Austr. x, pp. 298 & 299, 1 pl.

ZSCHOKKE, F. Beitrag zur Kenntnis der Fauna von Gebirgsseen. Zool. Anz. No. 326, pp. 37-40.

Catalogue of Fauna found in the three adjacent mountain lakes of Partnum, Tilisana, and Garschina, comprising some *Crustacea*.

II.—SYSTEMATIC.

The general classification of article *Crustacea* in the Encyclopædia Britannica has been followed.

Subclass 1. THORACIPODA = MALACOSTRACA.

General.

WALKER.

CLAUS (2) publishes a beautifully illustrated monograph of the *Nebaliidæ* and the *Leptostraca*.

WALTER describes 6 species and two varieties (1 new) of trans-Caspian *Isopoda*, one *Amphipod*, and one *Decapod* in his second paper of "Transkaspische Binnencrustaceen." [See Zool. Rec. xxv, *Crust.*, WALTER.]

Legion 1. *PODOPHTHALMIA*.

Order 1. DECAPODA.

General.

BROOK ; BUCHANAN ; MONIEZ, (2) p. 348.

HADDON & GREEN give 12 species of *Decapoda* found at Crookhaven, Ireland.

SARS (1) gives a detailed account of the larval forms of typical species of the genera *Lithodes*, *Eupagurus*, *Spiropagurus*, *Galathodes*, *Galathea*, *Munida*, *Porcellana*, and *Nephrops*.

Sub-order (a). *BRACHYURA*.

General.

CANO ; DE MAN.

Pinnotherion vermiforme, n. g. & sp., parasitic in *Pinnotheres*, which is

14 Crust.

CESTACRA.

is itself parasitic in a Mollusc (*Modiola*). It resembles *Grapsion* and *Portunon*, but is destitute of pigment. GIARD & BONNIER (1).

Varanus tomentosus, n. sp., from ZUMBAR, PFEFFER (1) p. 31.

Telphusa hilgendorfi, n. n. for *T. depressa*, Hilgendorf, which differs from *T. depressa*, KRASS : *id.* p. 32.

MACHIDE.

Simocarcinus pusillus, n. sp., from ASUMB, CANO, p. 174, pl. vii, figs. 3 & 4.

PRIEKSIDE.

Podohemia, n. g., *erythraea*, n. sp., CANO, p. 180, pl. vii, fig. 5.

Mitraculus tumidus, n. sp., *id.* p. 186, pl. vii, fig. 7. Payta.

CANCRIDE.

Atergalis granulatus, n. sp., DE MAN, p. 410, pl. ix, fig. 1.

Acteodes richtersii, n. sp., and *A. themisto*, n. sp., *id.* pp. 412 & 417, pl. ix.

Eurytelius, n. g., *deplanatus*, n. sp., CANO, p. 200, pl. vii, figs. 9 & 10.

Pilumnopus? lacrimans, n. sp., *id.* p. 207, pl. vii, fig. 12. Patagonia.

Actumaus targonii, n. sp., *id.* p. 209, pl. vii, fig. 13. Pernambuco.

Ebalia nux, n. sp., previously found in the Mediterranean, but hitherto undescribed, POCOCK, (1) p. 426, woodcut.

Blepharopoda japonica, n. sp., DUCUPLÉ, p. 93, woodcut.

Xantho (Lachnopus) takitensis, n. sp., DE MAN, p. 418, pl. ix, fig. 4.

OCTOPODIDÆ.

Pilumnoplax incerta, n. sp., CANO, p. 228, pl. vii, fig. 14.

GRAPSIDÆ.

Durckheimia carinipes, n. g. & sp., DE MAN, p. 442, pl. x, fig. 12.

Dynomene pugnatrix, n. sp., *id.* p. 444, pl. x, fig. 13.

Glyptograpsus spinipes, n. sp., CANO, p. 241, pl. vii, fig. 15.

Sesarma crassipes, n. sp., *id.* p. 244, Pernambuco.

Sesarma barbimana, n. sp., *id.* p. 245, Payta.

Sesarma oceanica, n. sp., DE MAN, p. 429, pl. x, fig. 9.

Sesarma edwardsii, n. var. *brevipes*, *id.* p. 425, pl. ix, fig. 6.

Sesarma trapezoidea, n. var. *longitarsis*, *id.* p. 427, pl. x, fig. 8.

PALEMONIDÆ.

Pseudotelphusa tenuipes, n. sp., POCOCK, (2) p. 7, pl. ii, fig. 1. (Perhaps = *P. dentata*, M.-Edwards.) Taken at Laudat at an altitude of 1,000 ft.

MIERSIDÆ.

Xiphocaris gladiator, n. sp., Pocock, (2) p. 18, pl. ii, figs. 6-8, with var. *intermedia*, Laion.

Xiphocaris brevirostris, n. sp., *id.* p. 20, pl. ii, figs. 4 & 5.

GEGARCINIDÆ.

Hylæocarcinus natalis, n. sp., Pocock, (4) p. 561.

Sub-order (b). ANOMURA.

DROMIDÆ.

Dromia bicarvosa, n. sp., from Kangaroo I., ZIETZ, pl. xiv, figs. 5, 5a, & 6.

GALATHEIDIA.

Porcellana pulchellula, n. sp., CANO, p. 260, S. Lorenzo.

PAGURIDIA.

Eupagurus corneus, n. sp., Pocock, (1) p. 428, woodcut.

Sub-order (c.) MACRURA.

GANONG; BOAS.

PARKER claims priority for his generic name *Jasus*, for the *Palinurus* group, which S. Bate, in his "Challenger *Macrura*," proposes to call *Palinostus*.

Gryllopagurus, n. g., with sp. *lithodomus*, from St. Vincent Gulf, S. Australia, ZIETZ, pl. xiv, figs. 1-4.

Sergestes sanguineus, n. sp., CHUN, (3) p. 538, pl. iii, fig. 1.

Eryma bizeti, *E. fulcifera*, and *E. corbieri* are names provisionally conferred upon three fossil specimens from the Fuller's earth of Éconché; MORRIÈRE, pp. 139-142, pls. iv & v.

Eryma carabæi is the name given to a Crustacean found in Callovian at Troarn, placed by Woodward among the *Brachyura*, but recognized by M.-Edwards as a *Macruran*; *id.* p. 143, pl. v, fig. 4.

Ophthalmeryon, n. g., *transitionalis*, n. sp., from stomach of Dolphin. Allied to *Eryonidæ*; BATE.

Homarus lehmanni, n. sp., found in a fossil state near Kiel, HAAS, p. 96, pl. iv, figs. 4 & 5.

Order 2. STOMAPODA.

Stylocheiron chelifer, n. sp., CHUN, (3) p. 537, pl. iii, fig. 4.

Gonodactylus spinosissimus, n. sp., from Zanzibar, PFEFFER, (1) p. 35.

Legion 2. *EDRIOPHTHALMIA*.

Order 3. ISOPODA.

DOLLFUS ; MONIEZ, (3) p. 254 ; VOSSELER (2) ; TOPSENT.

Armadillo javanensis, n. sp., from Java ; DOLLFUS, (3) p. 91, pl. v, fig. 1.

Sphæroma sieboldii, n. sp., *id.* p. 93, pl. v, fig. 3.

Metoponorthos barroisi, n. sp., Azores, *id.* (4) p. 306.

Chavesia, n. g., *costulata*, n. sp., *id.* p. 307.

Trichoniscus chavesi, n. sp., *id.*, p. 308.

Armadilloniscus tuberculatus, n. sp., *id.* p. 392.

Apeudes sculptus, n. sp., from S. Georgia, PFEFFER, (2) p. 41.

Ligia malleata, n. sp., from Zanzibar, *id.* (1) p. 36.

BOVALLIUS describes 5 n. spp. of *Isopoda*.

Nerocila philippensis, p. 3, pl. i, figs. 1-12.

Nerocila loveni, p. 6, pls. i, figs. 13-17, & ii, figs. 18-21.

Nerocila laticeps, p. 10, pls. ii, figs. 22-26, & iii, figs. 27 & 28.

Anilocra leptosoma, n. var. *caudata*, p. 13, pl. iii, figs. 29-38.

Anilocra hedenborgi, p. 15, pls. iii, fig. 39, & iv, figs. 40-45.

Anilocra guinensis, p. 17, pl. iv, figs. 46-54.

Iera guernei, n. sp., from the Azores, DOLLFUS (1).

Pinnotherion vermiforme, n. g. & sp., parasitic in the Mollusc *Pinnothere* ; GIARD & BONNIER (1).

Porcellio orientalis, n. var. *rubricornis* ; WALTER, p. 1118.

Porcellio cristatus, n. sp., DOLLFUS, (3) p. 91, pl. v, fig. 2.

Order 5. AMPHIPODA.

General.

BONNIEZ ; CHEVREUX ; CHUN ; GIARD ; GILES ; DE GUERNE ; MONIEZ, (3) p. 242 ; NORMAN ; VOSSELER (2) ; WRZÉSNIOWSKI ; NINNI ; TOPSENT.

BONNIER gives, on pp. 375-384 of his paper, a full description of *Unciola crenatipalmata* ; and on pp. 389-398, a detailed description of the other species of the same genus.

Gammarus spetsbergensis, n. sp., VOSSELER, (2) pl. viii, figs. 25-31.

Gammarus guernei, n. sp., CHEVREUX (2).

Anonyx küenthali, n. sp., VOSSELER, (2) p. 154, pl. viii, figs. 1-7.

Anonyx cæcus, n. sp., *id.* p. 155, pl. viii, figs. 8-14.

Leucothœ imparicornis, n. sp., from Shetland, NORMAN, (2) p. 114, pl. x, figs. 1-4.

Lilljeborgia picta, n. sp., *id.* p. 116, pl. x, figs. 5-9.

CHUN (3) considers all forms of *Phronima* hitherto described identical with *P. sedentaria*, but he found what he thinks to be a new species, *P. diogenes*, p. 527, pl. iii, figs. 5 & 6.

The male of *Phronima* has only lately been detected. It probably builds no special house for itself. CHUN (1).

Melita quadrispinosa, n. sp., from Spitzbergen, VOSSELER, (3) p. 157, pl. viii, figs. 15-24.

Fortunata, n. fam.: *Fortunata lepisma*, n. g. & sp., CHUN, (3) p. 532, pl. iii, figs. 8-10.

Cyanus physeteris, n. sp., parasitic in the Cachalot; POUCHET.

Boruta, n. g., *tenebrarum*, n. sp., WRZESNIOWSKI, p. 264. Figured on several plates.

Niphargus tatrensis, n. sp., *id.* p. 267. Figured on several plates.

Concholestes dentalii, n. g. & sp., GILES.

Elsia indica, n. g. & sp., *id.* GILES also gives n. spp. of *Anomys*, *Ampelisca*, *Microdentopus*, *Monoculodes*, *Atylus*, *Urothroe*, and *Caprella*. [See Zool. Rec. xxv, Crust., GILES.]

Megaluropus, n. g., with large eye on projecting head lobe, and with uropods bearing large foliaceous branches. *M. ægilis*, n. sp., NORMAN (1).

Amphitopsis dubia, n. sp., from Spitzbergen, VOSSELER, (2) p. 156, pl. viii, figs. 32-36.

Monoculodes subnudus, n. sp., NORMAN, (1) p. 450, pls. xviii, fig. 11, & xix, figs. 6-10.

Lysianax ceratinus, n. sp., WALKER, (3) p. 200, pl. x, figs. 1-8.

Podocerus isopus, n. sp., *id.* p. 209, pl. xi, figs. 11-13.

CHUN (2) establishes a new species, *Scina bovalii*, for what he had regarded as a male of *S. lepisma*, and gives a full description of the form.

WALKER (2) considers *Pleustes bicuspis*, Kröyer, and *Calliopius bidentatus*, Norman, identical, but thinks that S. Bate errs in referring his *Phorus bicuspis* to the same species.

Sub-class 2. GNATHOPODA = ENTOMOSTRACA.

General.

DE GUERNE & RICHARD; JONES & SHERBORN; JONES.

GOURRET (1) publishes a note dealing briefly with the *Entomostraca* of the Gulf of Marseilles, taken incidentally when Malacostracan forms were chiefly sought. The species are either pelagic or parasitic on fishes, Ascidians, &c. There are representatives of the orders *Copepoda*, *Cirripedia*, *Ostracoda*, and *Branchiopoda*. No new species are recorded.

Legion 4. BRANCHIOPODA.

DADAY; HAY; LILLJEBORG; NOLL.

Order 8. PHYLLOPODA.

ETHERIDGE; WOODWARD & JONES.

Branchipus diaphanus, Prev., n. var. *chyzeri*; DADAY, (1) p. 103.

Branchinecta iheringi, n. sp., LILLJEBORG (1).

Order 9. CLADOCERA.

DADAY (2), Hungarian *Cladocera*, 8 n. spp.; MONIEZ; MONIEZ, (2) p. 346; MONIEZ, (3) pp. 180 & 241; VILLEPOIX.

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- Coriodaphnia solis*, n. sp., from Titicaca, MONIEZ, p. 427, figs. 11-13.
Simocephalus caciens, n. sp., *id.* p. 426, figs. 9 & 10.
 POPPE (1) recognised Imhof's new *Bosmina* (*B. berolinensis*) as *B. bohémica*, Heliöck. He charges Imhof with insufficiently describing his so-called new genera. He also criticises his treatment of the genus *Diaptomus* in his "Fauna hochalpiner Seen."
Podon schmackeri, n. sp., POPPE, (2) p. 295.

Legion 5. LOPHYROPODA.

Order 10. OSTRACODA.

- SHERBOEN; BRADY & NORMAN; SARRS (2); OLAFS (5); KRAUSE; MONIEZ, (2) p. 278; MONIEZ, (3) p. 179.
Macrocypris (?) *pusilla*, n. sp., from Wenlock limestone, Malvern; JONES, (2) p. 268, pl. xv, fig. 10.
Bythocypris caudalis, n. sp., *id.* p. 270, pl. xv, figs. 2 & 3.
Aparchites decoratus, n. sp., *id.* p. 272, pl. xv, fig. 12.
Aparchites simplex, n. sp., *id.* p. 272, pl. xv, fig. 13.
Aparchites lindströmii, n. sp., *id.* p. 272, pl. xv, fig. 14.
Aparchites whiteavesii, n. sp., JONES, (1) p. 384, pl. xvii, fig. 10, 2 woodcuts.
Primitia scaphoides, n. sp., *id.* p. 377, pl. xvi, fig. 3.
Isophilina labrosa, n. sp., *id.* p. 383, pl. xvii, fig. 11, 2 woodcuts.
Cypris (?) *incarnum*, n. sp., from Titicaca; MONIEZ, p. 421, figs. 1-6.
Cyclocypris, n. g., to include *Cypris globosa*, SARRS; BRADY & NORMAN, p. 71, pls. xiv, figs. 1 & 2, & xi, figs. 10-18.
Scotia, n. g., to include *Cypris browniana*, JONES; *id.* p. 72, pla. ix, figs. 23 & 24, & xi, figs. 19-25.
Erpetocypris, n. g., *robertsonii*, n. sp., *id.* p. 88.
Erpetocypris olivacea, n. sp., *id.* p. 89, pl. i, figs. 3 & 4.
Cypridopsis variegata, n. sp., *id.* p. 91, pl. viii, figs. 20 & 21.
Candona elongata, n. sp., *id.* p. 100, pl. x, figs. 24-27.
Candona rostrata, n. sp., *id.* p. 101, pls. ix, fig. 11, & xii, figs. 22-31.
Ilyocypris, n. g., *id.* p. 106.
Anchistrocheles, n. g., *id.* p. 110.
Bairdia subcircinata, n. sp., *id.* p. 113.
Cythere confusa, n. n., for *C. pellucida*, *id.* p. 127.
Cythere corpulenta, n. sp., *id.* p. 134, pl. xvi, figs. 11 & 12.
Cythere lamellifera, n. sp., *id.* p. 135.
Cythere amissa, n. sp., *id.* p. 136.
Cythere trispicata, n. sp., *id.* p. 155, pl. xvi, figs. 5 & 6.
Cythere lepida, n. sp., *id.* p. 157, pl. xv, figs. 20 & 21.
Cythere audax, n. sp., *id.* p. 167, pl. xvii, figs. 14 & 15.
Cytheridea stigmosea, n. sp., *id.* p. 174, pl. xvi, figs. 21 & 22.
Cytheridea fascis, n. sp., *id.* p. 177, pl. xvi, figs. 23 & 24.
Krithe angusta, n. sp., *id.* p. 181, pl. xvii, figs. 10-13.
Cytherura exserta, n. sp., *id.* p. 196, pl. x, figs. 24 & 25.

- Cytherura grænlantica*, n. sp., iid. p. 199, pl. xviii, figs. 23 & 24.
Cytherura simplex, n. sp., iid. p. 200, pl. xviii, figs. 1 & 2.
Cytheropteron læve, n. sp., iid. p. 210, pl. xx, figs. 29-31.
Cytheropteron crassipinnatum, n. sp., iid. p. 212, pl. xx, figs. 16-18.
Cytheropteron depressum, n. sp., iid. p. 218, pl. xx, figs. 22 & 23.
Cytheropteron humile, n. sp., iid. p. 219, pl. xx, figs. 4-7.
Bythocythere bicristata, n. sp., iid. p. 222, pl. xix, figs. 15 & 16.
Bythocythere recurva, n. sp., iid. p. 224, pl. xix, figs. 24 & 25.
Paradozostoma fasciatum, n. sp., iid. p. 233, pl. xxi, figs. 25 & 26.
Paradozostoma productum, n. sp., iid. p. 236, pl. xxi, figs. 9 & 10.
Beyrichia lindströmi, n. sp., KIESOW, p. 5, pl. i, figs. 2-6.
Beyrichia lindströmi expansa, n. var., id. p. 6, pl. i, figs. 7-10.
Beyrichia buchiana varians, n. var., id. p. 7, pl. i, figs. 11-14.
Beyrichia lanensis, n. sp., id. p. 8, pl. ii, figs. 1 & 2.
Beyrichia klödeni bicuspsis, n. var., id. p. 11, pl. 2, figs. 6 & 7.
Beyrichia erratica, n. sp., KRAUSE, (1) p. 18, pl. ii, figs. 6-8.
Beyrichia marchica, n. sp., id. p. 19, pl. ii, figs. 9-11.
Beyrichia digitata, n. sp., id. p. 20, pl. ii, fig. 12.
Beyrichia palmata, n. sp., id. p. 21, pl. ii, fig. 13.
Klædenia(?) *globosa*, n. sp., id. p. 21, pl. ii, fig. 14.
Primitia plana, n. sp., id. p. 4, pl. i, figs. 1a & b.
Primitia sulcata, n. sp., id. p. 6, pl. i, figs. 2a & b.
Primitia distans, n. sp., id. p. 6, pl. i, figs. 3a & b.
Primitia cincta, n. sp., id. p. 7, pl. i, figs. 4 & 5.
Primitia jonesii, n. sp., id. p. 8, pl. i, fig. 6.
Primitia bursa, n. sp., id. p. 9, pl. i, figs. 7-10.
Primitia schmidtii, n. sp., id. p. 10, pl. i, figs. 14 & 15.
Primitia intermedia, n. sp., id. p. 11, pl. i, fig. 16.
Entomis sigma, n. sp., id. p. 12, pl. i, figs. 11-13.
Bollia v-scripta, n. sp., id. p. 13, pl. i, figs. 17 & 18.
Bollia granulosa, n. sp., id. p. 14, pl. ii, figs. 1 & 2.
Streptula lineata, n. sp., id. p. 15, pl. ii, fig. 3.
Streptula linnarssoni, n. sp., id. p. 16, pl. ii, figs. 4 & 5.

Order 11. COPEPODA.

General.

BOURNE; CANU (1); CANU (2); CLAUS (1, 4); GIARD; GIESBRECHT; JOUBIN; MONIEZ, (3) p. 175; SARS (2); THOMPSON, J. C.; VILLEPOIX; VOSSELER (1); DE GUERNE & RICHARD.

Metridea venusta, *M. princeps*, *M. curticauda*, and *M. brevicauda*, n. spp., from Porto Lagunas, GRIESBRECHT, (1) p. 24.

Pleuronima ziphias, n. sp., from Abrolhos, id. p. 25.

Acartia clausii, *A. liljeborgii* (Valparaiso), *A. spinicauda* (Amoy), *A. centrura* (Assab), *A. danæ*, *A. erythræ* (Assab), n. spp., id. pp. 25 & 26.

Corynura forcipata, *C. denticulata*, and *C. recticauda*, n. spp., from Assab, id. p. 26.

Labidocera lubbockii (Guayaquil), *L. euchata* (Amoy), *L. minutum*, (Hongkong), *L. orsinii* (Assab), *L. pavo* (Assab), n. spp., *id.* pp. 26 & 27.

Pontella tenuiremis, *P. danae*, *P. chierchia*, and *P. spinipes*, n. spp., *id.* p. 28.

Monops pilosus, *M. armatus*, *M. brevis*, *M. lubbockii*, and *M. tenuicauda*, n. spp., *id.* pp. 28 & 29.

Isias bonnieri, n. sp., CANU, (1) p. 228, pl. xvi.

Acartia verrucosa, n. sp., from Malta, THOMPSON, (2) p. 141, pl. vi, figs. 1-9.

Zosime rubra, n. sp., *id.* p. 146, pl. viii, figs. 1-8.

Copilia brucei, n. sp., *id.* p. 147, pl. ix, figs. 1-7.

Jonesiella hyæneæ, n. sp., THOMPSON, (3) p. 193, pl. ix, figs. 1-10.

Chalimus tenuis, n. sp., parasitic on tail-fin of a *Leptocephalus*; less than half the size of *C. scomberi*; LEIDY.

Diaptomus ambiguus, n. sp., from Behring I., LILLJEBORG, (2) p. 154.

Eurycercus glacialis, n. sp., *id.* p. 155.

Aspidæcia normani, n. g. & sp., parasitic on *Aspidophryxus peltatus*; it belongs to the group of *Choniostomatidæ*; GIARD & BONNIER (2).

CLAUS (1) revises the genus *Lichomolgus* to which he refers 8 spp., together with a n. sp., *L. anemoniæ*. He also describes a n. g., *Paranthessius*, to contain a single female, *P. anemoniæ*. His other new genera are :—

Pseudanthessius, with n. sp. *P. gracilis*.

Dermatomyzon, with n. sp. *D. elegans*.

Echinocheres, with n. sp. *E. violaceus*.

Mesochra blanchardi, n. sp., from Algeria, RICHARD (1).

Gastrodelpheys myxicolæ, n. sp., parasitic on *Myxicola infundibulum*; LIST (2). The author considers the genus *Gastrodelpheys* to form a distinct group connecting the *Notodelphydæ* with the *Siphonostomata*.

Diaptomus richardi, n. sp., SCHMEIL. The author deals with the whole genus, and gives clearly the points which distinguish the new species from those hitherto known.

Cyclops maarensis, n. sp., from the Eifel Lakes; VOSSELER (1).

Legion 6. ANCHORACEPHALA.

Order 13. CIRRHIPEDIA.

FISCHER; GIARD (5); DAWSON.

Protobalanina, n. subfam. *Protobalanus*, n. g., with n. sp. *hamiltonensis*, WHITFIELD, p. 67, pl. xiii, fig. 22.

Stephanolepas, n. g. (parasitic), FISCHER (1).

Sylon challenger, n. sp. (parasitic), HIECK (1).

ALIARUM FAMILIARUM.

Petrarcha bathyactidis parasitic in mesenteric chambers of *Bathyactis symmetrica*. Allied to *Laura* and *Synagoga*, and to be placed among the *Asecothoracida*; FOWLER (1). [See "Classification."]

Canthocamptus borcheringii, n. sp., POPPE, (3) p. 545, pl. viii, figs. 10-19.
Podocrates stolleyi, n. sp., HAAS, p. 88, pl. iv, figs. 1-3 & 6.

III.—MORPHOLOGY.

General.

CLAUS (2) discusses the morphology of the *Nebaliidæ*.

For morphology of *Cyclops*, see HARTOG (1).

KÖHLER (3) discusses, at considerable length, the general morphology of the Cirripedes.

GIARD (3) states that the position assumed by Bopyrids under the carapace of crabs, is precisely the reverse of that described by BOUVIER in his paper, "Sur la circulation de l'Ecrevisse." [See Zool. Rec. xxv, Crust., BOUVIER (3).]

OPPENHEIM describes a new fossil larval Crustacean, which he names *Clausia lithographica*.

Sense Organs.

CARRIÈRE gives a critical review of the conclusions of various writers: Reichenbach, Patten, Kingsley, Bertkau, Herrick, &c., with regard to the structure and development of the eyes of *Decapoda* and *Arachnida*. His own views are postponed.

For the development of the eye of *Alpheus*, see HERRICK.

BATESON finds that shrimps do not distinguish night from day by the eyes alone, as they continue their habit of hunting only by night when those organs are extirpated. Prawns and shrimps hunt chiefly by smell, the olfactory organ being mainly, but not exclusively, situated in the antennules.

CLAUS (2) finds in the *Nebaliidæ* a special frontal sense organ of unknown use on the eye-stalk.

Habits.

Most Crustaceans are more active by night than by day. Shrimps can only hunt safely at night. Some crabs were observed to tear pieces of weed with their chelæ, chew it, and then rub it deliberately over their backs and appendages until some adhered. *A. stenorhyncus*, cleaned and deprived of its eyes, performed this operation. BATESON.

PASCOE has some remarks on the frequency with which foreign bodies are found attached to the carapace of crabs. Seaweed, hairs, sand, shells, and sponges are the usual substances chosen. *Dromia vulgaris* is sometimes completely covered by a sponge. The hind legs of some species are much reduced, flattened, and dorsally directed, and have been thought to be of use in retaining such foreign substances; but this function is not proved. Some strong adhesive matter is evidently secreted, but its origin is obscure. Hooked hairs, which are often present, may partly explain the phenomenon.

HERDMAN regards it as conclusively proved that free-swimming *Crustacea* are attracted to a stationary net by the electric light.

Respiratory Organs and Appendages.

WELDON (1) believes that the spines of Crustacean *somae* enable them to maintain an upright position, and a direct course, when moving through the water. Spineless *somae* were observed to proceed spirally, with apparently involuntary somersaults, while larvae with spines swam swiftly and directly towards the light through a distance of several feet.

STAMATI describes a case of accessory growth on the exopodite of the left antenna of a Crayfish. Such supernumerary growths have hitherto only been observed on the legs of *Crustacea*.

BERGENDAL deals with observed variations of form in the appendages of the first abdominal segment of female *Crustacea*.

For the tegumentary structures of the *Lepodidae*, see KOEHLER.

RICHARD (2) describes a case of unusual structure in the right antenna of *Diaptomus*.

MISS BUCHANAN discusses the origin of the various positions of the gills of *Decapoda*. The abbranchiate Chætopod-like ancestors would naturally come to exhibit a vascular concentration where water would find the freest access, and the bases of swimming appendages present this condition. An advantageous increase of the branchial surface would ensue from a folding of this area of vascular concentration. The folded stem or "bract" of the thoracic limb of *Apus* is probably homologous to the Decapod gill. *Schisopoda*, *Stomatopoda*, and the higher *Isopoda* retain the primitive branchial position. The position of the Decapod gills is due to the former swimming-function of the thoracic appendages.

Vascular System.

CATTANEO discusses the structure and function of the amœboid cells in the blood of *Carcinus menas*.

LEYDIG finds that in *Argulus foliaceus* the heart is never very definite anteriorly, but much resembles other intermuscular spaces. The blood fluctuates rather than circulates.

The heart in *Nebaliidae* has seven pairs of ostia, dorsal and lateral. It extends from the maxillary region to the fourth abdominal segment. There is an anterior and a posterior artery, and some other definite arterial vessels. CLAUS (2).

Alimentary System.

CLAUS (2) finds in the *Nebaliidae* a complicated gastric mill, with two cardiac teeth, a ridge on the right side furnished with bristles, and two pairs of pyloric sieves. There are four pairs of liver diverticula, the first pair extending into the head. There is a dorsal caecum from the posterior end of the mesenteron.

Nervous System.

BOUVIER treats of the nervous system of *Decapoda* in its relations to the vascular apparatus.

FRIEDLÄNDER.

For the nervous system of the *Lepadidae*, see KÖHLER (2).

LEYDIG describes the nervous system of *Argulus foliaceus*. The so-called nerve terminations are probably skeletal structures.

CLAUS (2) states that the brain in *Nebaliidae* is comparatively highly organised, presenting greater complexity than that of the *Phyllopoda*, though somewhat less developed than that of the *Malacostraca*. There are olfactory glomeruli on the mid-brain, recalling the structure of *Isopoda*. The ganglia of the second antennæ form a hind-brain, and are situated on the œsophageal commissures. The mandibular ganglion is distinct from the maxillary, and in front of it there is a feebly developed subœsophageal commissure. The thoracic ganglia are distinct, as are the six abdominal ganglia. A seventh abdominal ganglion present in larval forms, degenerates in the adult.

Generation and Development.

PEREYASLAWZEWA (2) describes the development of *Caprella ferox*. It was found necessary to remove the chorion before cutting. The stages which precede segmentation precisely resemble those of *Gammarus*. The segmentation is described, with the formation of the germinal layers, of which the derivatives are indicated.

For the development of *Orchestia litorea*, see PEREYASLAWZEWA (1).

MÜLLER's investigation of spermatogenesis in *Ostracoda* leads him to the following conclusions:—Mother cells are matured either in the middle of the testicular tubes (*Pontocypris*) or at their ends (freshwater Cyprids). Each mother-cell ordinarily gives rise to four sperm cells. The complicated tailpiece of the spermatozoon is formed of one or two subsidiary nuclei. There is a cœcum in the efferent duct where the spermatozoa, variously arranged in the testis, turn so as to continue their passage with their heads directed forwards. The spermatozoa consist of a central filament and three longitudinally connected bands, of which the central one is contractile and causes the spiral twisting.

ROULE has studied the development of the blastodermic layers in *Isopoda*. In *Asellus aquaticus* a number of "blastomeres" are formed by radial division of the yolk. These, by radial and tangential division, give rise to excessively thin-walled cells, forming a *Planula*. The walls are not seen in section. Hyaline protoplasm appears at what will be the anterior end of the embryo, and extends ventrally and then dorsally. Sections exhibit nuclei in the superficial layer, which now becomes hyaline and distinct from the meso-endoblast.

LIST (1) finds that the ovaries and oviducts of *Gastrodelpyda* (*Copepoda*) are paired, and that there is a receptaculum seminis where the eggs are fertilised. He arrives at the following results: (1) The formation of egg-cells takes place in an ovary filled with polygonal cells. (2) The matured egg-cells are successively separated off, and pass into the oviduct

to receive their investment of yolk substance. (3) The substitution of new eggs for those which have been passed off takes place in the first part of the ovary. (4) The hind part of the ovary partly supplies a germ-layer to invest the cells formed in the fore-part. (5) The ripe eggs, on their way to the brood-pouch, pass through the receptaculum, where they are fertilised.

BROOK & HOYLE, after giving a brief account of the work hitherto done on the *Euphausiidae*, describe for the first time an almost complete series of moults for one species. Eggs of two sizes, but apparently differing in no other respect, were observed. Six stages characteristic of the metamorphosis are briefly described :—(1) *Nauplius*, with three pairs of appendages. (2) A second *Nauplius* stage, with additional bud-like maxillæ and maxillipedes. The next one or two moults have escaped observation. (3) *Metanauplius*. (4) *Calytopis*, with cephalothorax and abdomen, developing compound eye and uropods. (5) Stage intermediate between *Calytopis* and *Furcilia*. (6) *Furcilia*, with complete compound eyes; antennæ still natatory. In one form eleven moults were observed.

The generative ducts of the *Nebaliidae* resemble those of the *Malacostraca*. The young, even when hatched and moulting, are carried by the mother between the lamellæ and the bristle-fans of the thoracic limba. CLAUS (2).

KINGSLEY'S researches on the development of *Crangon* give the following results :—The egg is not centrolecithal with superficial segmentation, but having central segmentation, cells migrating to the surface to form the blastoderm. The primitive groove is the modified blastopore. The young germinal area is larger than the much older embryo. All the appendages are primitively post oral. There are indications of segmental organs in every segment of the embryo. Of the alimentary tract, the liver alone is endodermal. The green gland, which represents a segmental organ, is a mesodermal structure. The genital ducts are modified nephridia. The nauplius does not represent any adult ancestral condition.

WEISMANN & ISCHIKAWA observed in the eggs of Daphnids, a cell, other than the sperm cell. It is at first inactive, but after partial segmentation it fuses with one of the cleavage cells. The signification of this process—which the authors call paracopulation—is not at all clear. They also describe the development of the germinal vesicle into the egg-nucleus, and find confirmation of the law of numbers of the polar bodies.

BROOK took, off the W. coast of Scotland, a Decapod larva much resembling *Lucifer*, but having five pairs of pereopods. He proposes to name it *Trachelifer*.

BROOKS finds that in the larva of *Stenopus*, which is much larger than ordinary pelagic larvæ, the fifth thoracic legs are the chief locomotor organs, ending in flattened paddles. The very small eggs are laid at night. The yolk does not participate in segmentation. The development of the larva has points of resemblance to *Lucifer*, *Sergestes*, and *Pneus*. When hatched, the eyes are sessile and the antennæ locomotor. The hind-body, which is faintly segmented, has no appendages.

BOAS distinguishes two forms of *Palamonetes varians*, marine and

freshwater, specifically inseparable when adult, but developing differently. The main differences may be thus tabulated:—

SALT-WATER FORM.	FRESH-WATER FORM.
Small egg.	Large egg (eight times as large as that of marine form).
Zoea gill-less.	Gilled zoea.
Mysis stage normal.	Mysis stage incomplete.
Feeds from birth.	Subsists for long on the yolk.

The freshwater form appears to be derived from the marine.

SCHIMKEWITSCH deals with the development of parasitic *Copepoda*.

STOSSICH gives a *résumé* (in Italian) of recent papers by Giard on parasitic castration.

DELLA VALLE deals with generation in *Gammarus pulex*. The oviducts have ordinarily no external apertures, but the deposition of eggs is preceded by a casting of the integument, whereby external openings are temporarily formed. Fertilisation is quite external, no intromittent organ being employed. The sperm is ejected upon the ventral surface of the female, round the terminations of the oviducts. The eggs issue simultaneously by the two oviducts, and are accompanied by a viscid substance which plugs the orifices. The eggs are at first without any trace of chorion, which, however, appears after fecundation.

Excretory Organs.

A Prawn, stained as in Kowalevsky's experiments, and dissected in strong alcohol, showed a blue area in the thorax, connected by stained bands of tissue with the nephridia. This blue area is a sac containing a clear fluid, in contact with the generative organs posteriorly, and giving off anteriorly a tubular process on each side to the urinary bladder. It thus precisely resembles the coelomic sac of Molluscs. There are caecal appendages on the tubular processes lined by a characteristic epithelium. The comparison frequently made between the glomerules of the vertebrate kidney and the end-sac of the Crustacean green-gland is fully justifiable; WELDON (2).

BEDDARD deals with *Amphipoda* in his discussion of the origin of the Malpighian tubules in the *Arthropoda*.

IV.—PHYSIOLOGY.

LEYDIG has investigated the dermal glands of *Argulus foliaceus*. They are usually unicellular, but sometimes compound. By employing certain reagents, he caused the hardened secretion to project from the efferent duct. The author further describes the histology of the nervous system, with the distinctly tubular nerve fibres, and shows that what have hitherto been regarded as nerve terminations are probably skeletal structures. The frontal and paired eyes are also separately treated of. The blood fluctuates rather than circulates.

GIARD (4) observed a *Talitrus* so phosphorescent that Quatrefage's explanation by noctilucae on the carapace seemed hardly satisfactory. The slow movements of the animal appeared, moreover, to indicate disease. Microscopic examination of an appendage showed microbes of the genus

GIARD & BONNIER (5) adduce further reasons for placing the *Dajida* between the *Cryptoniscina* and the *Bopyrina*. The head and thorax recall *Phryxina*; the antennæ and rostrum resemble those of immature *Cryptoniscina*.

DURUFLÉ re-arranges the genus *Blepharopoda* thus:—

No median spine on carapace	{	Foliateous chelæ with two external spines. Four lateral teeth on carapace	}	<i>B. occidentalis</i> .
		No spines on chelæ. Three lateral teeth on carapace		
Median spine on carapace	{	Mobile spineless finger, four lateral teeth	}	<i>B. spinosa</i> .
		Four lateral teeth, finger armed with three spines		

GOURRET (3) attempts a new classification of *Crustacea*.

BONNIER gives the characteristics of the principal groups of *Amphipoda* thus:—

AMPHIPODA.	{	Pleon well developed	{	6 pairs of pleiopods	{	maxilipede rudimentary	<i>. Hyperina.</i>
						maxilipede	6th pleiopod
						well	with endopodile. <i>Gammarina.</i>
						developed	6th without . <i>Corophina.</i>
{	{	5 pairs of pleiopods	{	without.	{	5th and 6th	<i>. Cerapina.</i>
							<i>. Dulichina.</i>
							<i>. Læmodipoda.</i>
{	{	Rudimentary pleon	{		{		

He then divides the group *Corophina* thus:—

COROPHINA.	{	2 or 3 jointed palp.	{	pereiopod with large coxopodite	{	No mandibular palp	<i>. Orchestidæ.</i>
						2nd and 3rd joints of maxilipede narrow	<i>. Stenothoidæ.</i>
						2nd and 3rd joints of maxilipede lamellar	<i>. Microprotopidæ.</i>
						pereiopod with narrow and small exopodite	<i>Corophiidæ.</i>

He then similarly divides the family *Corophiidæ*, and subsequently its genus *Unciola*.

CLAUS (2) places the *Leptostraca* among the *Malacostraca*, of which they form the first main division. To the same series, though not to the same order, belong the fossil *Archæostraca*, which agree with them in possessing a moveable head-valve.

VI. PALÆONTOLOGY.

WHITFIELD; FRIÜ; KIESOW; KRAUSE; MORIÈRE; OPPENHEIM; WHIDBORNE.

ETHERIDGE, WOODWARD, & JONES issue their Sixth Report on the fossil *Phyllopoda* of the Palæozoic rocks.

FISCHER describes two species of *Lepas* from the Miocene of Bordeaux. JONES & SHERBORN supplement their monograph of 1857 on the Tertiary *Entomostraca* of England. 120 species are treated of, and 66 figured.

For Palaeozoic bivalved *Entomostraca* of Canada, see JONES (1); of Scandinavia, *id.* (2).

SAFFORD & VOGDES describe a new fossil Crustacean, *Aspeya americana*, from the Lower Silurian of Tennessee.

SHERBORN, in his notes on the fossil *Ostracoda*, gives a general account of the group, but describes no new species.

THOMPSON, B., in discussing the Upper Lias of Northamptonshire, gives, on p. 82, a short list of *Crustacea* obtained from it.

VII.—GEOGRAPHICAL DISTRIBUTION.

(a) PALEARCTIC.

British Isles.

Pelagic *Copepoda* of Plymouth; BOURNE.

HADDON & GREEN give 12 species of *Decapoda* from the S.W. of Ireland, on p. 34. Other *Crustacea* are given on p. 43.

JONES & SHERBORN give 120 species of English Tertiary *Entomostraca*.

NORMAN treats of British *Amphipoda*.

POCOCK (1) deals with deep-sea *Crustacea* from the coast of Ireland.

SCOTT gives 5 species of *Crustacea* from the Forth.

THOMPSON (1, 3) describes some *Copepoda* new to Britain, from Liverpool Bay. See also WALKER (2, 3).

A short list of fossil *Crustacea* from Northamptonshire is given by THOMPSON, B.

Some Devonian *Crustacea*; WHIDBORNE.

European.

BRADY & NORMAN devote 8 pp. of their monograph to tables indicating the distribution of the various groups. On pp. 250–255 the fresh-water *Ostracoda* are given; the marine *Ostracoda* and the *Podocopoda*, on pp. 256–258. Pp. 258–264 are occupied with an exhaustive bibliography of the subject.

For a tabular view of the distribution of *Crustacea* in N.W. German fresh waters, see POPPE, (3) p. 542.

6 species of *Cyclops*, 3 of *Diaptomus*, and 1 of *Canthocamptus*, were found in the Eifel Lakes; VOSSELER (1). See also ZACHARIAS.

French free-swimming marine *Copepoda*; CANU.

Crustacea of Lusitania; CAZARRO.

Amphipoda of the Gironde; CHEVREUX (1).

DADAY (1) gives seven forms of the genus *Branchipus*, from Hungary.

For Hungarian *Cladocera*, see DADAY (2). He gives 100 species, 8 being new.

Fossil specimens of *Lepas* at Bordeaux; FISCHER (2).

Pelagic Copepoda of Spitzbergen ; GIESBRECHT (2).

Entomostraca from the Gulf of Marseilles ; GOURRET (1, 3).

For the distribution of fresh-water *Copepoda*, see DE GUERNE & RICHARD.

For Scandinavian Palæozoic bivalved *Entomostraca*, see JONES (2).

15 species of *Beyrichia*, from Gotland, are given by KIESOW.

For various French *Crustacea*, see MONIEZ.

OSORIO (1) gives 101 species of Portuguese *Crustacea*, none of which are new.

For N.W. German fresh-water *Crustacea*, see POPPE (3).

Copepoda from the coast of Malta ; THOMPSON (2).

For *Copepoda* and *Cladocera* from the Somme Valley, see VILLEPOIX.

Amphipoda and *Isopoda* of Spitzbergen ; VOSSELER (2).

DALLA TORRE gives a list of the *Crustacea* of Heligoland.

See also OPPENHEIM and ZSCHOKKE.

African and Asiatic.

A short list of Egyptian *Crustacea* will be found in KAISER, p. 190.

PFEFFER (1) gives an account of *Crustacea* collected in Egypt and Zanzibar.

For *Copepoda* from Algeria, see RICHARD (1).

WALTER deals with certain Trans-Caspian *Crustacea*.

(b.) NEARCTIC.

For Canadian Palæozoic bivalved *Entomostraca*, see JONES (1).

GANONG discusses the Crayfish in N. Brunswick.

On pp. 41 & 42 of his "Fauna of S. Georgia," PFEFFER (2) gives a list of *Crustacea*.

For fossil *Crustacea* of Tennessee, see SAFFORD & VOGDES.

(c.) NEOTROPIC.

LILLJEBORG (1) describes two *Phyllopoda* from Brazil.

For *Entomostraca* from Lake Titicaca, see MONIEZ (1).

Crustacea from Dominica, POCOCK (2).

(d.) AUSTRALASIAN AND OCEANIC.

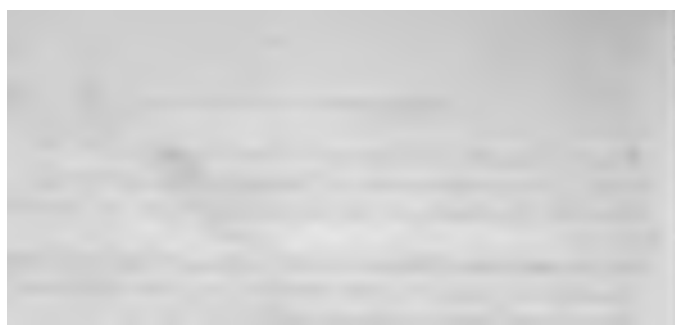
SARS (2) deals with some Australian freshwater *Ostracoda* and *Copepoda*.

ZIETZ gives an account of some *Crustacea* from Australia.

On pp. 97-105 of CANO's work will be found a statement of the geographical distribution of the *Brachyura* taken on the voyage of the "Vettor Pisani."

For *Crustacea* of the Azores, see CHEVREUX (2, 5) ; DOLLFUS (2, 4) ; DE GUERNE (*Amphipoda*).

POCOCK (4) deals with the land *Crustacea* of Christmas I.



1

ARACHNIDA.

BY

R. INNES POCOCK.

TITLES OF PAPERS

DEALING WITH ANATOMY, PHYSIOLOGY, ETC., OF ARACHNIDA (S.S.) (ACARI EXCEPTED).

APSTEIN, CARL. Bau und Function der Spinndrüsen der Araneida. Arch. f. Nat. 1889, pp. 29-74, pls. iii-v.

BERTKAU, PH. Ueber ein "Begattungszeichen" bei Spinnen. Zool. Anz. xii, pp. 450-454.

CAMBOUÉ, R. P. Sur l'utilisation de deux Aranéides séricigères de Madagascar. Rev. Sci. Nat. App. xxxvi, pp. 117-119.

CARRIÈRE, J. Bau und Entwicklung des Auges der zehnfüssigen Crustaceen und der Arachnoiden. Biol. Centralbl. ix, pp. 225-234.

CORSON, E. R. The Spider-bite question again. Ins. Life, i, pp. 280-282.

CATTANEO, G. Sulla Morfologia delle Ameboidi dei Molluschi ed Artropodi: Arachnida. Boll. scient. xi, pp. 43-46, pl. ii, figs. 56-73.

The species experimented upon are *Tegenaria domestica*, *Amaurobius ferox*, and *Scorpio* [?] *europæus*.

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FARNANI, J. Die Genitalorgane der *Thelyphonus*. Biol. Centralbl. ix, pp. 376-382.

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In *Tegenaria domestica* the liver corresponds functionally to the pancreas of Vertebrates, and the Malpighian tubes are the renal organs.

* An asterisk prefixed to a quotation indicates that the Recorder has not seen the journal or work referred to.

- HASSELT, A. W. M. VAN. Le Muscle Spiral et la Vésicule du Palpe des Araignées mâles. Tijdschr. Ent. xxxii, pt. 3, pp. 161-203, pls. vi & vii.
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 —. (2) Ueber die giftigen Spinnen Russlands. SB. Ges. Dorp. viii, pp. 340, 341, & 362-364.
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 A popular description of the anatomy of *Epeira diademata*.
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- (2) On some New Species and a New Genus of *Araneidea*. P. Z. S. 1889, pp. 34-46, pl. ii.
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- (2) Daten zur Kenntniss der Pseudoscorpionen-Fauna des Caucasus. Op. cit. xii, pp. 16-22, pl. ii.
- (3) Eine neue *Pseudoscorpion*-Art in der Sammlung des Ungar. National Museums. T. c. pp. 23 & 24, pl. ii.
- (4) Neuere Daten zur Kenntniss der Pseudoscorpionen-Fauna von Ungarn. T. c. pp. 25-28, pl. ii.
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AUSTRALIAN REGION.

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Norfolk Island. URQUHART (3).

ARANEÆ.

EPEIRIDÆ.

Epeira camilla, n. sp., JAONSAR, p. 338; *himalayana*, n. sp., JAONSAR, p. 339; *nympha*, n. sp., JAONSAR, p. 339; *minutalis*, n. sp., JAONSAR, p. 340; SIMON (8).

Epeira viridicans, n. sp., Te Karaka, p. 116; *mulleola*, n. sp., Whangarei, p. 118, fig. 6; *helreo-guttata*, n. sp., Tarawera, p. 119; *tri-tuberculata*, n. sp., Te Karaka, p. 120; *orientalis* (URQ.), p. 121; URQUHART (1).

Epeira dumicola, n. sp., Te Aroha, p. 146; *mulleola* (URQ.), Te Karaka, p. 147; *id.* (2).

Epeira tetragnathoides, n. sp., Guatemala, Panama, p. 16; *illicita*, n. sp., Guatemala, p. 17, pl. vi, fig. 16; *intercisa*, n. sp., Panama, p. 18, pl. v, fig. 11; *laticeps*, n. sp., Panama, p. 18, pl. iv, fig. 16; *cylindrica*, n. sp., Guatemala, p. 19; *passiva*, n. sp., Guatemala, p. 20, pl. v, fig. 4; *bimaculata*, n. sp., Guatemala, Panama, p. 21, pl. vi, fig. 12; *graphica*, n. sp., Panama, p. 22; *gegralis*, n. sp., Panama, p. 22, pl. v, fig. 3; *incerta*, n. sp., Costa Rica, p. 23, pl. iv, fig. 15; *fragilis*, n. sp., Panama, p. 23, pl. iv, fig. 18; *helvola*, n. sp., Mexico, p. 24, pl. v, figs. 1 & 2; *solersoides*, n. sp., Panama, p. 25; *expleta*, n. sp., Guatemala, p. 25, pl. vi, fig. 11; *detrimentosa*, n. sp., Guatemala, p. 26, pl. vi, fig. 7; *secunda*, n. sp., Guatemala, p. 26, pl. vi, fig. 9; *birariolata*, n. sp., Guatemala, p. 27, pl. vi, fig. 15;

sargi, n. sp., Guatemala, p. 28, pl. vi, fig. 5; *liabilis*, n. sp., Guatemala, p. 28; *ocellata*, n. sp., Guatemala, p. 29, pl. vi, fig. 17; *aculifera*, n. sp., Guatemala, p. 29, pl. vii, fig. 3; *lineatipes*, n. sp., Guatemala, p. 30; *mobilis*, n. sp., Mexico, p. 30, pl. vi, fig. 1; *rufipes*, n. sp., Guatemala, p. 31, pl. iv, fig. 12; *latebricola*, n. sp., Panama, p. 31; *nephiloides*, n. sp., Guatemala, p. 32; *purpurascens*, n. sp., Guatemala, Panama, p. 33; *gravabilis*, n. sp., Panama, p. 33, pl. v, fig. 7; *rufa*, n. sp., Guatemala, Panama, p. 34, pl. vi, fig. 18; *hoxaa*, n. sp., Panama, p. 35, pl. v, fig. 6; *consequa*, n. sp., Mexico, Panama, p. 36; *rigida*, n. sp., Panama, p. 36, pl. v, fig. 5; *clavispina*, n. sp., Guatemala, p. 37, pl. vii, fig. 11; *hypocrita*, n. sp., Panama, p. 38, pl. v, fig. 8; *destricta*, n. sp., Panama, p. 39, pl. iv, figs. 13 & 14; *guatemalensis*, n. sp., Guatemala, p. 40, pl. vii, figs. 7 & 8; *armata*, n. sp., Panama, p. 41, pl. iv, fig. 17; *championi*, n. sp., Panama, p. 42, pl. v, figs. 12 & 13; *septem-mammata*, n. sp., Guatemala, p. 42, pl. vii, fig. 6; *spinigera*, n. sp., Panama, p. 43, pl. v, figs. 9 & 10; *tauricornis*, n. sp., Guatemala, Panama, p. 44, pl. vi, fig. 2; *spicata*, n. sp., Guatemala, p. 45, pl. vi, fig. 4; *variolata*, n. sp., Guatemala, p. 46, pl. vi, fig. 14; CAMBRIDGE (1).

Turckheimia, n. g., p. 46, *nodosa*, n. sp., Guatemala, p. 47, pl. iv, fig. 11; *icalckenaerii*, n. sp., Guatemala, p. 47; *id. t. c.*

Carepalxis tuberculifera, n. sp., Panama, p. 48, pl. iv, fig. 9; *gibbosa*, n. sp., Panama, p. 48, pl. iv, fig. 10; *americana*, n. sp., Panama, p. 49, pl. iv, fig. 7; *id. t. c.*

Alpaida, n. g., p. 52, *conica*, n. sp., Panama, p. 53, pl. iv, fig. 3; *id. t. c.*

Mohadiva undecim-variolata, n. sp., Panama, p. 53, pl. iii, fig. 8; *reticulata*, n. sp., Panama, p. 54, pl. iii, fig. 10; *id. t. c.*

Amumra, n. g., p. 55, *bituberosa*, n. sp., Costa Rica, p. 56, pl. iii, fig. 11; *id. t. c.*

Kaira, n. g., *altiventer*, n. sp., Panama, p. 56, pl., fig.; *id. t. c.*

Azilia guatemalensis, n. sp., Guatemala, Panama, p. 12, pl. iii, figs. 3 & 4; *id. t. c.*

Mangora, n. g., p. 13, *trilineata*, n. sp., Guatemala, Panama, p. 14, pl. iii, fig. 7; *picta*, n. sp., Guatemala, p. 14, pl. iii, figs. 5 & 6; *id. t. c.*

Epeiroides fasciolata, n. sp., Panama, p. 15, pl., fig.; *id. t. c.*

Larinia pubiventris, n. sp., Imam-baba, p. 381; SIMON (9).

Larinia quadrinotata, n. sp., Jaonsar, p. 340; *id. t. c.*

Argiope trivittata, n. sp., p. 51, Guatemala, pl. iv, figs. 5 & 6; CAMBRIDGE (1).

Zilla caspica, n. sp., Imam-baba, p. 382; SIMON (9).

Cercidia punctigera, n. sp., Jaonsar, p. 341; *id. t. c.*

Gastracantha rufospinosa and *crepidophora* figured, p. 22; PECKHAM.

Gastracantha ocellata, n. sp., Norfolk Island, pp. 152-154, pl. vii; URQUHART (3).

Gastracantha unguifera, n. sp., Jaonsar, p. 336; SIMON (8).

Acrosoma spinea figured, pl. iii, figs. 1-3; PECKHAM.

Cyclosa excelsa, n. sp., *spirifera*, n. sp., p. 337; *fissicauda*, n. sp., Jaonsar, p. 338; *id. t. c.*

Cyclosa fissicauda, n. sp., Guatemala, p. 50; *lacerta*, n. sp., Guatemala, Panama, p. 50; *index*, n. sp., Guatemala, p. 51, pl. vi, fig. 6; CAMBRIDGE (1).

8. Arachn.

ARACHNIDA.

Meia brevipes, n. sp., Guatemala, p. 1, pl. i, fig. 3; *globosa*, n. sp., Guatemala, p. 2, pl. i, fig. 5; *alboguttata*, n. sp., Guatemala, p. 2, pl. i, figs. 1 & 2; *decolorata*, n. sp., Guatemala, p. 3, pl. i, fig. 4; *id. t. c.*

Argyropeira idonea, n. sp., Panama, p. 4, pl. i, fig. 7; *acuminata*, n. sp., Panama, p. 5, pl. i, fig. 6; *debilis*, n. sp., Panama, fig. 5, pl. i, fig. 9; *fragilis*, n. sp., Costa Rica, p. 6, pl. i, fig. 11; *lepidia*, n. sp., Panama, p. 7, pl. i, fig. 8; *id. t. c.*

Tetragrathia cognata, n. sp., Guatemala, p. 7, pl. ii, figs. 10 & 11; *guatemalensis*, n. sp., Guatemala, p. 8, pl. ii, figs. 6 & 7; *tenax*, n. sp., Guatemala, p. 8, pl. i, fig. 12; *longa*, n. sp., Guatemala, p. 9, pl. ii, fig. 4; *tenuissima*, n. sp., Guatemala, p. 9, pl. iii, figs. 1 & 2; *pallida*, n. sp., Panama, p. 10, pl. ii, fig. 8; *tropica*, n. sp., Guatemala, p. 11, pl. ii, fig. 3; *id. t. c.* *T. notophylla*, n. sp., Lima, p. 129; BOERIS (1).

Eugnatha gracilis, n. sp., Guatemala, p. 11, pl. ii, figs. 1 & 2; CAMBRIDGE (1).

ULOBORIDÆ.

Uloborus sosis (Walck.), Bermudas, pl. iv, fig. 1; MARX (3).

THERIDIONIDÆ.

Linyphia subterranea (Em.), Wyandotte and Carter Caves, p. 57, pl. xv, figs. 29-31; *weyeri* (Em.), Weyer's Cave, p. 57, pl. xv, figs. 7-12; *incerta*, n. sp., Fountain Cave, p. 57, pl. xv, figs. 13-21; PACKARD (2).

Linyphia purpureo-punctata, n. sp., Wairongomai, p. 134; *nitidula*, n. sp., Te Aroha, p. 136; *rufo-lineata*, n. sp., Te Aroha, p. 137; *semoralis*, n. sp., Te Aroha, p. 140; URQUHART (2).

Linyphia rufoccephala, n. sp., Dunedin, p. 109, pl. xi, fig. 1; *lucenifera*, n. sp., Otago, p. 111, fig. 4; *id.* (1).

Nesticus pallidus (Em.), Fountain Cave, p. 57, pl. xv, figs. 22-27; *carteri* (Em.), Bat Cave, p. 57, pl. xv, fig. 28; PACKARD (2).

Anthobia mammothia (Tellk.), Mammoth Cave, p. 58, pl. xv, figs. 1-6; *id. t. c.*

Chasmocephalon, n. g., *neglectum*, n. sp., Swan River, p. 45; CAMBRIDGE (2).

Walcknaera interjecta, n. sp., Hoddesdon and Holland, p. 18; *id.* (4).

Theridion subvittatum, n. sp., p. 342, Jaonsar; SIMON (8).

Theridium nigrifolium, n. sp., Waikato, p. 112, pl. xi, fig. 3; *helvolum*, n. sp., Waikato, p. 113, fig. 2; *truncatum*, n. sp., Otago, p. 115, fig. 5; *ecornatum*, n. sp., Waikato, p. 115; URQUHART (1).

Theridium brunneo-folium, n. sp., Te Aroha, p. 142; *niger-punctillum*, n. sp., Te Aroha, p. 143; *porphyreticum*, n. sp., Wairongomai, p. 144; *gracilipes*, n. sp., Te Aroha, p. 145; *id.* (2).

Thalasoma tuberosum, n. sp., Te Karaka, p. 149; *id. t. c.*

PHOLCIDÆ.

holcus tipuloides (L. K.), Bermudas, pl. iv, fig. 5; MARX (3).

CINIFLONIDÆ.

Under this family, EMERTON describes the following from New England :—

Dictyna, p. 444 ; *muraria*, n. sp., p. 445, pl. ix, fig. 1 ; *volucripes*, Keys., p. 446, pls. ix, fig. 2, & xi, fig. 3 ; *longispina*, n. sp., p. 446, pl. ix, fig. 4 ; *bostoniensis*, n. sp., p. 447, pl. ix, fig. 3 ; *minuta*, n. sp., p. 447, pl. ix, fig. 5 ; *rubra*, n. sp., p. 448, pl. ix, fig. 7 ; *cruciata*, n. sp., p. 448, pl. ix, fig. 6 ; *volupis*, Keys., p. 448, pl. ix, fig. 8 ; *frondea*, n. sp., p. 449, pl. ix, fig. 9.

Amaurobius, p. 450, *silvestris*, n. sp., p. 451, pl. x, fig. 1 ; *ferox* (Walck.), p. 451, pl. x, fig. 3 ; *tibialis*, n. sp., p. 452, pl. x, fig. 3.

Titaneca, p. 453 ; *americana*, n. sp., p. 453, pl. x, fig. 4 ; *brunnea*, n. sp., p. 453, pl. x, fig. 5.

Uloborus, p. 454, *plumipes*, Luc., syn. *Phillyra riparia*, Hentz, p. 454, pl. xi, fig. 1 ;

Hyptioles cavatus (Hentz), p. 456, pl. xi, fig. 2.

THOMISIDÆ.

Xysticus tristrami (Cambr.), Durum, p. 380 ; SIMON (9).

Oxyptila lugubris (Cron.), Askhabad, p. 381 ; *id. t. c.*

Cebrennus verneai, n. sp., Grande Canarie, p. 302 ; *id. (6).*

Thanatus imbecillus (L. K.), ? syn. *T. arenarius* (Cron.), p. 379 ; *id. (9).*

Philodromus lepidus (Blackw.), syn. *maritimus* (Sim.), ? *fullax* (Cron.) p. 380 ; *id. t. c.*

Thomisus albus (Gm.), syn. *onustus*, *sanguinolentus* (Walck.), p. 380 ; *id. t. c.*

Selenops montigena, n. sp., Jaonsar, p. 335 ; *id. (8).*

MIIAGRAMMOPIDÆ.

Miagrammopes ectensa, n. sp., Jaonsar, p. 342 ; SIMON (8).

ZODARIIDÆ.

Zodarium raddei, n. sp., Artschman, p. 383 ; SIMON (9).

AGELENIDÆ.

Cedicus mærens, n. sp., Chodscha-Kala, p. 378 ; SIMON (9).

Cedicus bucculentus, n. sp., Jaonsar, p. 343 ; *id. (8).*

Anyphæna soricina, n. sp., Jaonsar, p. 344 ; *id. t. c.*

DICTYNIDÆ.

Dictyna cronebergi, n. sp., Nova-Merw, p. 385 ; SIMON (9).

10. *Arachn.*

ARACHNIDA.

DRASSIDÆ.

- Clubiona hyalina*, n. sp., Jaonsar, p. 343; SIMON (8).
Drassus fugax (Sim.), ? syn. *lutescens* (Cron.), p. 383; *id. t. c.*
Scylax, n. g., *walteri*, n. sp., Mor-Kala, p. 384; *id. t. c.*
Pythonissa musiva, n. sp., Grand Canary; *cornuasi*, n. sp., Grand Canary, p. 303; *id. (6)*.
Gnaphosa pittieri, n. sp., Lausanne, p. 63; GÉTAZ.
Behemus castrodunensis, n. sp., Lausanne, p. 63; *id. t. c.*
Amaurobioides maritima (Cambr.), N. Zealand; GOYEN (2).
Chiracanthium ragassi, n. sp., Pisco (Peru), p. 127; BOERIS (1).
Liocranum patagonicum, n. sp., Port Grappler, p. 128; *id. t. c.*

ERESIDÆ.

- Stegodyphus gregarius*, n. sp., Durban, p. 42, pl. ii, figs. 4 & 5; CAMBRIDGE (2).
Eresus cinnaberinus, var. *rotundiceps* (Sim.), Karndocha-batyr, p. 384; SIMON (9).

DYSDERIDÆ.

- Dysdera aculeata* (Cron.), ? syn. *concinna* (L. Koch), Krasnowodsk, p. 384; SIMON (9); *concinna* (L. Koch), ? syn. *aculeata* (Cron.), Meshed, p. 112; POCOOCK (1).
Segestria senoculata, n. var., *castrodunensis*, Lausanne, p. 64; GÉTAZ.

LYCOSIDÆ.

- Dolomedes aquaticus*, n. sp., Otago, p. 133; GOYEN (1).
Lycosa uliginosa, n. sp., Wanaka, p. 136; *bellicosa*, n. sp., Otago, p. 138; *id. t. c.*
Lycosa atlantica, n. sp., Bermuda, p. 100; MARX (3).
Lycosa alticeps (Cron.), Askhabad, p. 376; *raddei*, n. sp., Nova-Merw, Amu-Daria, p. 376; *soror*, n. sp., Nova-Merw, p. 377; SIMON (9).
Lycosa (Tarantula) medica, n. sp., Meshed, p. 111, pl. xiii, fig. 1; POCOOCK (1).
Pisaura novicia (L. K.), ? syn. *Ocyale mirabilis* (Cron.), Askhabad, p. 376; SIMON (9).
Hippasa deserticola, n. sp., Imam-baba, p. 377; *innesi*, n. sp., Egypt, p. 378; *id. t. c.*
Hyposinga greenlandica, n. sp., Greenland, p. 290; *id. (7)*.

ATTIDÆ.

- Sallicus formicarius*, fig., p. 26; PECKHAM.
Synemosyna lupata, p. 27; *formica*, p. 112, fig.; *id.*
Dendryphantus capitatus, p. 30, fig.; *id.*
Diolenius venustus, p. 35; *id.*
Habrocestum splendens, *auratum*, and *peregrinum*, pl. i; *id.*
Astia vittata, pl. ii; *id.*
Pseudicius harfordi, pl. ii; *id.*
Phidippus cardinalis, *johnsonii*, pl. ii; *id.*

- Zygoballus bellini*, pl. ii ; *id.*
Calliethera tenuimana, n. sp., Krasnowodsk, p. 373 ; SIMON (9).
Pseudicius vittatus, n. sp., Sary-jasy, p. 374 ; *id. t. c.*
Heliophanus niveivestis, n. sp., Vetus-Merw, p. 374 ; *id. t. c.*
Attulus, n. g., p. 374, *validus*, n. sp., Vetus-Merw, p. 375 ; *id. t. c.*
Ælurillus ater (Cron.), Askhabad, p. 376 ; *id. t. c.*
Ælurillus quadrimaculatus, n. sp., Jaonsar, p. 334 ; *id.* (8).
Phlegra icioides, n. sp., Jaonsar, p. 334 ; *id. t. c.*
Homalattus mus, n. sp., Jaonsar, p. 335 ; *id. t. c.*
Menemerus paykullii (Aud.), pl. iv, fig. 2 ; *melanognathus* (Lucas),
 fig. 3 ; MARX (3).
Marpessa leucophæa, n. sp., Waikato, p. 121, pl. xi, figs. 10 & 11 ;
arenaria, n. sp., Waikato, p. 123 ; *æri-hirta*, n. sp., Te Karaka, p. 124 ;
 URQUHART (1).
Plexippus herbigradus, n. sp., Te Aroha, p. 150 ; *id.* (2).

HYPOCHILIDÆ.

New group for the reception of *Hypochilus*, a genus connecting the Tetrapneumones with the *Filistatidæ* amongst the Dipneumones ; MARX (1, 2).

THERAPHOSIDÆ.

SIMON (4) classifies the family as follows :—

Section A.—TRIONYCHÆ.

1. Subfam. ATYPINÆ.—*Atypus*, Latr. (= *Madognatha*, Auss.), *Calom-mata*, Luc., *Campytarsus*, Thor.
2. Subfam. HEXURINÆ.—*Mecicobothrium*, Holmb., *Hexura*, Sim., *Brachybothrium*, Sim., *Atypoides*, Cambr.
3. Subfam. PARATROPINÆ.—*Paratropis*, Sim.
4. Subfam. PACHYLOCELINÆ.—*Aganippe*, Cambr., *Stasimopus*, Sim., *Pachyloscelis*, Luc. (= *Actinopus*, Pert.), *Eriodon*, Latr., *Closterochilus*, *Antrodiaetus*, Auss., *Theragretes*, Auss., *Hadronyche*, L. Koch.
5. Subfam. CTENIZINÆ.
 - A. Tribe MIGÆ.—*Migas*, L. K., *Moggridgea*, Cambr., *Myrtale*, Sim.
 - B. Tribe ANAMÆ.—*Atrax*, Cambr., *Aname*, L. Koch., *Fufius*, Sim.
 - C. Tribe PACHYLOMERI.—*Pachylomerus*, Auss., *Chorizops*, Auss., *Conothele*, Thor.
 - D. Tribe NEMESIÆ.—*Nemesia*, Sav., *Arbanitis*, L. K., *Genysa*, *Hermacha*, *Spiroctenus*, Sim., ? *Misgolas*, *Hermes*, Karsch.
 - E. Tribe APOROPTYCHI.—*Rhytidicolus*, *Ancylotrypa*, *Phænothele*, *Phæoclita*, *Aporoptychus*, *Celidotopus*, Sim.
 - F. Tribe CTENIZÆ.—*Cteniza*, Latr., *Aepicephalus*, Auss., *Bolostromus*, *Cyrtocarenum*, Auss., *Acathyma*, L. K., ? *Myrmekiaphila*, *Nidivalvata*, Atk.
 - G. Tribe CYRTAUCHENII.—*Cyrtauchenius*, Thor., *Entychides*, *Atmetochilus*, Sim., *Stenoterommatu*, Holm., *Eucteniza*, Auss.

H. Tribe IDIOPE.—*Idiops*, Pert., *Idiosoma*, Auss., *Pseudidiops*, Sim.

6. Subfam. DIPLURINÆ.

A. Tribe DIPLURÆ.—*Diplura*, C. K., *Urachus*, *Mitothela*, Sim., *Brachythela*, Auss., *Hapalothela*, Lona, ? *Heterothela*, Karsch, *Celhegus*, Thor.

B. Tribe MACROTHELÆ.—*Eutomothela*, *Phymothema*, Sim., *Buagrus*, *Macrothela*, Auss., ? *Ischnothela*, Auss., *Thelocoris*, *Linothela*, Karsch.

C. Tribe MASTERIÆ.—*Masteria*, L. K., *Accola*, Sim.

D. Tribe HEXATHELÆ.—*Hexathela*, Auss.

Section B.—*DIONYCHÆ*.

1. Subfam. BARYCHELINÆ.

A. Tribe BARYCHELI.—*Idiommata*, *Strophaeus*, Auss., *Idionthelma*, Cambr., *Barychelus*, *Encyocrypta*, *Cyphonissa*, *Pisenor*, Sim., *Tritama*, *Idioclis*, L. Koch.

B. Tribe LEPTOPELMATA.—*Leptopelma*, Auss., *Enthycaeus*, *Epipedesis*, *Psalistops*, *Stothis*, *Trichopelma*, *Cosmopelma*, Sim.

C. Tribe SASONES.—*Sason* (= *Sarpedon*, Camb.), *Satricus*, Sim.

2. Subfam. AVICULARINÆ.

A. Tribe ISCHNOCOLI.—*Ischnocolus*, Auss., *Dryptopelma*, Sim.

B. Tribe CHATOPELMATA.—*Chatopelma*, *Cycloternum*, Auss., *Chatorhombus*, Auss., *Adranochelia*, *Hapalopus*, *Stichoplastus*, Sim.

C. Tribe CRYPSIDROMI.—*Phlogius* (= *Phrictus*, L. K.), *Ozopactus*, Sim., *Harpaxibius*, *Cyrtoternum*, *Callyntropus*, *Crypsidromus*, Auss.

D. Tribe SELENOCOSMIÆ.—*Phoneiusa*, Kar., *Pelinobius*, Kar., *Cyriopagopus*, *Loxomphalia*, *Harpaxotheria*, Sim., *Harpactira*, *Selenocosmia*, Auss.

E. Tribe TRECHONÆ.—*Trechona*, C. K., *Thalerommata*, Auss., ? *Holothela*, *Schizothela*, Kar.

F. Tribe PÆCILTHERIÆ.—*Pæcilotheria* (= *Scurria*, C. K.), Sim.

G. Tribe THERAPHOSÆ.—*Theraphosa*, Thor., *Acanthoscurria*, Auss., *Acanthopalpus*, Auss.

H. Tribe AVICULARIÆ.—*Avicularia*, Lam., *Tapinauchenius*, Auss., *Scodra*, L. Becker.

I. Tribe EURYPELMATA.—*Eurypelma*, C. K., *Sericopelma*, *Lasiochneis*, *Mygalurachne*, *Homœomma*, Auss., *Sphaerobothria*, Karsch, *Phryzotrichus*, Sim. (= *Orthotrichus*, Karsch).

TRIONYCHILÆ.

Atypus cedrorum, n. sp., Cèdres (N. Afr.), p. 380; SIMON (1).

Paratropis, n. g., *scruposa*, n. sp., Peru, Pebas, p. 215; *id.* (4).

Pachyloscelis caraiiba, n. sp., Caraccas, p. 176; *sculops*, n. sp., Caraccas; *rajasi*, n. sp., Caraccas; *valenciana*, n. sp., Valencia, p. 177; *id.* t. c.

Moggyridgea abrahami, n. sp., S. Africa, p. 41, pl. ii, fig. 3; CAMBRIDGE (2): *tidmarshi*, n. sp., Grahamstown, p. 578; LENZ.

Pachylomerus asperulus, n. sp., Caraccas, p. 179; SIMON (4): *ædificatorius* (Westw.), syn. *Act. algerianus* (Luc.), *Unmida picea* (Thor.), nest described, p. 380; *id.* (1): *natalensis*, n. sp., Natal, p. 35, pl. ii, fig. 1; CAMBRIDGE (2). [According to SIMON, (4) p. 180, in note, this species is probably synonymous with *Cyrtocarenum rufilens* (Auss.); at all events, it is referable to the genus *Cyrtocarenum*.]

Nemesia tubifex, n. sp., Gulran, p. 112, pl. xiii, fig. 2; POOCK (1).

Hermacha, n. g., p. 407, *caudata*, n. sp., Delagoa Bay, p. 408; SIMON (3).

Spiroctenus, n. g., p. 408, *personatus*, n. sp., Delagoa Bay, p. 409; *id. t. c.*

Aporoptychus africanus, n. sp., Congo, p. 405; *id. t. c.*

Ancylotrypa, n. g., p. 406, *fossor*, n. sp., Landana, p. 406; *spinosa*, n. sp., Port Elizabeth, p. 407; *id. t. c.*

Phæoclita, n. g., *fuuna*, n. sp., Caraccas, p. 184; *id.* (4).

Celidotopus, n. g., *pulchripes*, n. sp., San Esteban, p. 185; *id. t. c.*

Rhytidicolus, n. g., p. 185, *structor*, n. sp., San Esteban, p. 186; *id. t. c.*

Phænothele, n. g., p. 399, *gaujoni*, n. sp., Amazula, p. 399; *id.* (2).

Acontius, n. g.; KARSCH, SB. nat. Fr. 1889, p. 64 (cf. SIMON (3), p. 407).

Cyrtachenius (Thor.), syn. in part *Cyrtcephalus* (Luc.), *cyrtachenius* (Thor.), p. 381, *walckenaeri* (Luc.), ? syn. *doleschulli* (Auss.) nest described, p. 382; SIMON (1).

Dolichoscapus, n. g., p. 383, *gracilipes* (Luc.), syn. *terricola* (Luc.), Algiers, &c., p. 385; *maculatus*, n. sp., Oran, &c., p. 386; *luridus* (Sim.), Oran, p. 386; *vittatus* (Sim.), Bon, &c., p. 387, pl. i, fig. 1 (nest); *daiensis*, Sim., Oran, p. 387; *bedeli* (Sim.), Oran, p. 388; *artifer*, n. sp., W. Algeria, p. 388, pl. i, figs. 2-4; *structor*, n. sp., Oran; *latastei* (Sim.), Algeria, &c., p. 390, pl. ii, fig. 1; *bicolor*, n. sp., Tlemcen, p. 392; *castaneiceps*, n. sp., Algeria, &c.; *inops*, n. sp., Tlemcen, p. 393, pl. i, fig. 5; *id. t. c.*

Idiops colletti, n. sp., Upper Burma, p. 37, pl. ii, fig. 2; CAMBRIDGE (2): *argus*, n. sp., Porto Cabello, p. 180; *fuleipes*, n. sp., Caraccas, p. 181; SIMON (4).

Pseudidiops, n. g., p. 182, *opifex*, n. sp., p. 215, Cayenne; *id.* (4).

Dendricon, n. g., *rastratum*, n. sp., Organ Mts. (Brazil), p. 250, figs. 1-5; CAMBRIDGE (3).

Diplura soricina, n. sp., Venezuela, p. 139; SIMON (4): *cousini*, n. sp., Quito, p. 400; *id.* (2): *bicolor*, n. sp., Brazil, Caraccas, p. 215; *id.* (4).

Uruchus, n. g., p. 400, *gaujoni*, n. sp., Ecuador, p. 411; *id.* (2).

Physiochema, n. g., *ruddei*, n. sp., Krasnowodsk, p. 385; *id.* (9).

Entomothele pusilla, n. sp., Caraccas, p. 190; *guianensis* (Walck.), Guiana, Brazil, p. 216; *id.* (4).

Accola, n. g., *lucifuga*, n. sp., p. 191; *toarensis*, n. sp., Tovar, *cyclops*, n. sp., Caraccas, p. 192; *id.* (4).

DIONYCHÆ.

Idiophthalmus pantherinum, n. sp., San Esteban, p. 193; *amazonicum*, n. sp., Amazons, p. 216; SIMON (4): *robustum*, n. sp., Quito, p. 401; *id.* (2).

Cyphonisia, n. g., p. 409, *obesa*, n. sp., Congo, p. 410; *id.* (3).

Pisenor, n. g., *notius*, n. sp., Zambezi; *nigellus*, n. sp., Congo, p. 411; *id.* t. c.

Leptopelma (Auss.), p. 395; *elongatum* (Sim.), sub. *Cyrtachenius*, syn. *L. africanum* (Auss.), Marocco, &c., p. 395, pl. ii, fig. 2; *cavicola*, n. sp., N. Africa, p. 396, pl. ii, fig. 3; *id.* (1).

Psalistops, n. g., *melanopygia*, n. sp., Caraccas, p. 196; *zonatus*, n. sp., Tovar, p. 197; *tigrinus*, n. sp., San Esteban, p. 198; *id.* (4).

Stothis, n. g., *cenobita*, San Esteban, p. 198; *astuta*, n. sp., Caraccas, p. 199; *id.* t. c.

Enthycalus, n. g., *colonica*, n. sp., p. 200; *steini*, n. sp., Tovar, p. 201; *id.* t. c.

Epipedesis, n. g., p. 201, *solitarius*, n. sp., Catuche (Venezuela); *opifex*, n. sp., Guaira (Venezuela), p. 202; *montigena*, n. sp., San Esteban, p. 203; *id.* t. c.

Cosmopelma, n. g., *decoratum*, n. sp., Bahia, p. 217; *id.* t. c.

Drytopelma, n. g., *ianthinum*, n. sp., Quito, p. 402; *id.* (2).

Cyclosternum gaujoni, n. sp., Ecuador, p. 403; *id.* t. c.

Chaetorhombus kochi (Auss.), Tovar, p. 205; *id.* (4).

Adranochelia, n. g., *rufohirta*, n. sp., San Esteban, p. 207; *id.* t. c.

Stichoplastus, n. g., *ravidus*, n. sp., Venezuela, p. 208; *id.* t. c.

Hapalopus cervinus, n. sp., San Esteban; *inflatus*, n. sp., Puerto Cabello, p. 209; *elegans*, n. sp., Venezuela, p. 210; *sellatus*, n. sp., Brazil; *modestus*, n. sp., Colombia, p. 218; *flavohirtus*, n. sp., Brazil, p. 219; *id.* t. c.

Crypsidromus familiaris, n. sp., Caraccas, p. 211; *tetricus*, n. sp., Caraccas, p. 212; *id.* t. c.

Ozopactus, n. g., *ernsti*, n. sp., Caraccas, p. 212; *id.* t. c.

Loxomphalia, n. g., p. 412, *rubida*, n. sp., Zanzibar, p. 413; *id.* (3).

Pelinobius gabonicus, n. sp., Gaboon, p. 413; *id.* t. c.

Harpazotheria, n. g., p. 413, *antilope*, n. sp., Congo; *gracilipes*, n. sp., Congo, p. 414; *ectypa*, n. sp., Abyssinia, p. 415; *id.* t. c.

Avicularia velutina, n. sp., San Esteban, p. 213; *id.* (4).

Eurypelma (*Lasiadora*) *augusti*, n. sp., Quito, p. 403; *vespertinum*, n. sp., Quito, p. 404; *id.* (2).

PEDIPALPI.

PHRYNIDÆ.

Catageus, n. g., p. 530; *pusillus*, n. sp., Farm Caves (Moulmein), p. 531; THORELL.

Phrynus goesii, n. sp., St. Bartholomew (W. Indies), p. 530 (in note); *id.*

Charon cavernicola, n. sp., Farm Caves (Moulmein), p. 538; *id.*

SCHIZONOTIDÆ.

Tripettis, n. g., p. 554, *grassii*, n. sp., Teinzo, p. 554; *cambridgei*, n. sp., Prome, p. 559; THORELL.

THELYPHONIDÆ.

Hypoctonus formosus (Butl.), syn. *angustus* (Stol.), Burma, p. 542 ; THORELL ; OATES, p. 14.

Synopsis of the Indian, Burmese, and Malayan species of *Thelyphonus*, pp. 6-8 ; OATES.

Thelyphonus assamensis (Stol.), syn. *scabrinus* (Stol.), *psittacinus* (Butl.), Assam, Sikkim, p. 8, pl. ii, fig. 13 ; *indicus* (Stol.), syn. *beddomei* (Stol.), S. India, Bengal, p. 9, figs. 1-6 ; *johorensis*, n. sp., Johore, p. 11, fig. 11 ; *andersoni*, n. sp., Upper Burma, p. 11, fig. 12 ; *wood-masoni*, n. sp., Mooleyit, p. 12, fig. 10, *insularis*, n. sp., Double I., p. 13, figs. 7 & 8 ; *binghami*, n. sp., Reef I., p. 15 ; *saxatilis*, n. sp., Thayetmyo, p. 17 ; *rangunensis*, n. sp., Rangoon, p. 18 ; *silvaticus*, n. sp., Minhla, p. 18 ; *id.*

Thelyphonus amurensis, n. sp., Amour, p. 119 ; *strauchii*, n. sp., Philippines, p. 120 ; *maximus*, n. sp., Brazil, p. 121 ; TARNANI.

SCORPIONES.

Isometrus shoplundii (Oates), Prome, p. 562 ; *mucronatus* (Fabr.), syn. *varius* (C. Koch), Burma, Siam, Cochin China, Java, Sumatra, New Zealand, p. 566 ; *fee*, n. sp., Shwegoo (Burma), p. 569 ; THORELL.

Isometrus americanus (Linn.), syn. *obscurus* (Gerv.) and *forcipula* (Gerv.), Columbia, &c., compared with *I. androcottoides* (Karsch), S. America and W. Indies, pp. 53-57 ; *insignis*, n. sp., Santa Lucia, p. 57 ; POCOCK (4).

Buthus grammurus, n. sp., Khandalla, p. 567 (in note) ; THORELL.

Buthus cognatus (L. Koch), recorded from Krasnowodsk and described, p. 386 ; SIMON (9).

Buthus parthorum, n. sp., Meshed, p. 113, pl. xiii, fig. 3 ; *afghanus*, n. sp., Meshed, p. 116, fig. 4 ; POCOCK (1).

Buthus martensii (Karsch), India, and *B. hottentotta* (Fabr.), Africa, compared, the sexual characters pointed out, pp. 335 & 336, pl. xv, figs. 1 & 2 ; *confucius* (Simon), not syn. *martensii* (Karsch), China, p. 336, fig. 2a ; *socotrensis*, n. sp., Socotra, p. 337, fig. 3 ; *atlantis*, n. sp., Mogador, p. 340, fig. 4 ; *philippsii*, n. sp., Bushire, p. 341, fig. 6 ; *villosus* (Peters), recorded from Benguela and the Congo and compared with *lionoma* ; *planicauda*, n. sp., W. and S. Africa, p. 344, fig. 5 ; *limbatus*, n. sp., Madagascar, p. 346, fig. 7 ; *piceus*, n. sp., Madagascar, p. 349 fig. 8 ; *id.* (2).

Buthus lobidens, n. sp., Antongil Bay (Madagascar), p. 361 ; *id.* (3).

Butheolus (Sim.), syn. *Orthodactylus* (Karsch), nom. preocc. ; *conchini*, n. sp., Bely-bugor, p. 386 ; SIMON (9).

Butheolus (*Orthodactylus*) *schneideri* (L. K.), recorded from Meshed, p. 117, pl. xiii, fig. 5 ; POCOCK (1).

Scorpiops lindströmi, n. sp., Mooleyit, p. 573 ; *lugubris*, n. sp., Mooleyit, p. 579 ; THORELL.

16 *Arachn.*

ARACHNIDA.

Chelomachus, n. g., p. 583, *birmanicus*, n. sp., Rangoon, p. 584 ; *id.*
Palamneus petersii (Thor.), syn. *bengalensis* (Sim.), Burma, p. 588 ; *id.*
Hadrurus robustus, n. sp., Lima, p. 125 ; BOERIS (1).

SOLPUGÆ.

Galeodes fumigatus, n. sp., Askhabad, p. 1096, pl. xxix, fig. 1 ;
WALTER.

Rhax plumbescens, n. sp., 1100, pl. xxix, fig. 2 ; *eylandti*, n. sp., p. 1101,
fig. 3 ; *melanopyga*, n. sp., p. 1103, fig. 4, Askhabad ; *id.*

Rhax aurea, n. sp., Meshed, p. 118, pl. xiii, fig. 6 ; POCOCK (1).

Rhax semiflava, n. sp., Kohat (Punjab), p. 473 ; *id.* (5).

Karschia, n. g., p. 1104 ; *cornifera*, n. sp., Balchan, p. 1105, pl. xxix,
fig. 5 ; WALTER.

OPILIONES.

Phalangodes robusta (Pack.), Colorado, p. 48, pl. xiv, fig. 2 ; *flavescens*
(Cope), p. 49, pls. xii & xiv, fig. 4, n. var. *weyerensis*, Weyer's Cave, p. 50,
n. var. *cæca*, Carter Cave, p. 50 ; *armata* (Tellk.), syn. *Phrizis longipes*
(Cope), Kentucky (caves), p. 50, pl. xiii ; *spinifera*, n. sp., Key West,
p. 52, pl. xiii, fig. 2 ; PACKARD (2).

Phlegmacera, n. g., *cavicolens* (Pack.), Bat Cave, p. 54, pl. xiv, fig. 5 ;
id. t. c.

Nemastoma troglodytes (Pack.), Clinton's Cave (Utah), pp. 54 & 55,
pl. xiv, fig. 3 ; *inops* (Pack.), Bat Cave, p. 55, pl. xiv, fig. 4 ; *id. t. c.*

The genera *Liobunum*, *Oligolophus*, and *Phalangium* characterised,
p. 81 ; WEED (1).

Liobunum dorsatum (Say), p. 83 ; *vittatum* (Say), p. 85 ; *nigripalpi*
(Wood), p. 87 ; *verrucosum* (Wood), p. 88 ; *elegans*, n. sp., p. 89 ; *politus*,
n. sp., p. 89 ; *calcar* (Wood), p. 90 ; *formosum* (Wood), p. 91, with fig.,
from N. America ; *id. t. c.*

Phalangium cinereum (Wood), Illinois, p. 93 ; *id. t. c.*

Oligolophus pictus (Wood), Illinois, p. 95 ; *id. t. c.*

THORELL describes the following from Burma :—

PALPATORES.

Zaleptus (Thor.), p. 609, *subcupreus*, n. sp., Tenasserim, p. 609 ; *festivus*,
n. sp., Tenasserim, p. 611 ; *sulphureus*, n. sp., Tenasserim, p. 614.

Ceratobunus, n. g., p. 615, *annulatus*, n. sp., Mooleyit, p. 616 ; *bimacu-*
latus, n. sp., Bhamo, Shwegoo, p. 619 ; *lugubris*, n. sp., Catcin, p. 621.

Arthrocentrus, n. g., p. 623 ; *atratus*, n. sp., Mooleyit, p. 623.

Gagrella (Stol.), p. 625, synopsis of species, pp. 625 & 626 ; *lepida*, n. sp.,
with varr. *dibelona* and *claducha*, Tenasserim, p. 626 ; *armillata*, n. sp.,
Prome, p. 629 ; *chelopus*, n. sp., Burma, p. 631 ; *sordidata*, n. sp.,
Mooleyit, p. 634 ; *erebea*, n. sp., Bhamo, Teinzo, p. 636 ; *minar*, n. sp.,
Meetan, &c, p. 638 ; *luticæca*, n. sp., Thagatà-Juvà, p. 641 ; *ænescens*, n. sp.,

Mooleyit, p. 643; *rufescens*, n. sp., Mooleyit, p. 645; *fae*, n. sp., with varr. *humeralis* and *bispinosa*, Meetan, Rangoon, p. 648; *nocticolor*, n. sp., with var. *distincta*, Bharno, p. 651; *histrionica*, n. sp., Bharno, p. 652; *cervina* (Sim.), Meetan, p. 655; *spinulosa*, n. sp., Kaw-Kareet, p. 657.

Melanopa, n. g., p. 659; *plebeia*, n. sp., Prome, Minhla, p. 659; *tristis*, n. sp., Bharno, Teinzo, p. 662.

Scotomenia, n. g., p. 664; *cestrata*, n. sp., Bharno, Teinzo, p. 665.

Oncobunus, n. g., p. 667, *galeatus*, n. sp., Shwegoo, p. 667.

LANIATORES.

Biantes (Sim.), p. 760, type of new family; *lecithodes*, n. sp., Prome, Rangoon, p. 671.

Epedanoidæ, family characterised, p. 674.

Thyneotus, n. g., p. 676, *bifasciatus*, n. sp., Thagatà-Juvà, p. 678.

Bupares, n. g., p. 682, *caper*, n. sp., S. Burma, p. 682; *capellus*, n. sp., Mooleyit, p. 687; *mitylus*, n. sp., Teinzo, p. 690.

Assamioideæ, family characterised, p. 692.

Assamia (Sör.), p. 694, *sex-dentata*, n. sp., Meetan, &c., p. 694; *bituberculatus*, n. sp., Rangoon, &c., p. 698; *arenensis*, n. sp., Rangoon, p. 701, *reticulata* (Sim.), Meetan, &c., p. 704.

Miracandus (Sim.), p. 706, *rhinoceros*, n. sp., Mooleyit, p. 707.

Bæoris, n. g., p. 710, *manducus*, n. sp., Tenasserim, p. 711.

Pygoplus, n. g., p. 714, *obscurus*, n. sp., Bharno, &c., p. 715; *trifasciatus*, n. sp., Prome, p. 718; *ferrugineus*, n. sp., Teinzo, p. 721; *variatus*, n. sp., Thagatà-Juvà, p. 723.

Sucesphorus, n. g., p. 209, *maculatus*, n. sp., Prome, p. 209.

PSEUDOSCORPIONES.

Chernes armatus (Töm.), Ashanti; *chyzeri* (Töm.), Hungary, pl. iv, fig. 7; *scorpioides* (Herm.), syn. *affinis* (Töm.), Hungary, fig. 8, p. 170; *cyrneus* (L. K.), n. var. *hungaricus*, Hungary, p. 171, pl. iv, figs. 4 & 6; *montigenus* (Sim.), *cinieoides* (Fabr.), Hungary, p. 172; *lucertosus* (L. K.), syn. *rufecolus* (Töm.), in part, Corfu; *phaleratus* (Sim.), syn. *rufecolus* (Töm.), in part, Hungary, p. 173; DADAY (1).

Chernes horvathi, n. sp., Caucasus, p. 17, pl. ii, figs. 1-6; *id.* (2).

Chernes scorpioides (Fabr.), n. var. *bertulunii*, Visz, p. 26, pl. ii, figs. 3, 7, 12, & 16; *id.* (4).

Chernes brasiliensis, n. sp., Cazaza, p. 23, pl. ii; *id.* (3).

Ectoceras nodulinanus (Töm.), syn. *macrochelatus* (Töm.), Dalmatia (?), Sumatra, Ashanti, p. 173, pl. iv, figs. 3-9; *hungaricus*, n. sp., Hungary, p. 174, figs. 1 & 2; *id.* (1).

Ectoceras caucasicus, n. sp., Caucasus, p. 18, pl. ii, fig. 13; *frivaldskyi*, n. sp., Caucasus, p. 19, fig. 4; *id.* (2).

Ectoceras herzegovini, n. sp., Herzegovina, p. 81; *id.* (5).

Chelifer clariger, n. sp., Bharno, p. 591, pl. v, fig. 5; *birmanicus*, n. sp., Bharno, Teinzo, p. 591, fig. 6; *oritus*, n. sp., Mooleyit, p. 597, fig. 7;

sumatranus, n. sp., Singalau, p. 599 (in note); *hanseni*, n. sp., Bhamo, p. 600, fig. 8; *bisulcus*, n. sp., Bhamo, p. 603, fig. 9; THORELL.

Chelifer cancroides (Linn.), *peculiaris* (L. K.), *rutilans* (Töm.), *disjunctus* (L. K.), *subruber* (Sim.), *tegulatus* (Töm.), pl. iv, figs. 11, 13, & 15; *danaus* (Töm.), recorded from Hungary, and characterised, pp. 175–179; DADAY (1).

Chelifer kussariensis, n. sp., Caucasus, p. 20, pl. ii, fig. 11; *id.* (2).

Garypinus, n. g., with new family *Garypininae*, p. 179, type *dimidiatus* (L. K.), under *Olpium*, syn. *semivittatum* (Töm.), Morea, p. 180; *id.* (1).

Cheiridium tetrophthalmum, n. sp., Hungary, p. 27, pl. ii, figs. 8, 10, & 14; *id.* (4).

Garypus minor (L. K.), Corfu, *biareolatus* (Töm.), E. Indies, characterised, pp. 181 & 182; *id.* (1).

Blothrus spelæus (Sch.), Carinthia; *brevipes* (Friv.), syn. *minutus* (Töm.), Hungary, pp. 183 & 184; *id.* (1).

Roncus lubricus (L. K.), *alpinus* (L. K.), Hungary, pp. 184 & 185; *id. t. c.*

Roncus microphthalmus, n. sp., Caucasus, p. 21, pl. ii, fig. 2; *id.* (2).

Obisium precipuum (Sim.), syn. *blothroides* (Töm.); *validum* (L. K.); *simile* (L. K.), *cephalonicum*, n. sp., pl. iv, fig. 22; *carcinoides* (Herm.), *dumicola* (L. K.), n. var. *nitidum*, pl. iv, fig. 24; *erythrodactylum* (L. K.), *museorum* (Leach), *manicatum* (L. K.), pl. iv, fig. 25; *macrodactylum*, n. sp., pl. iv, fig. 26; recorded from various parts of Hungary and characterised, pp. 185–189; *id.* (1).

Obisium littorale, n. sp., p. 102; MONIEZ.

Obisium cavicola (Pack.), Virginia (in cave), pp. 42 & 43, fig. 11; PACKARD (2).

Chthonius syn. *Heterolophus* (Töm.); *tetrachelatus* (Preyss.), syn. *heterodactylus* (Töm.); *diophthalmus*, n. sp., pl. iv, figs. 21–27, Mehadia; *nitens* (Töm.), *guttiger* (Töm.), pl. iv, fig. 20, Brazil; *orthodactylus* (Leach), Deva, pp. 189–192; DADAY (1).

Chthonius packardii (Hagen), pp. 43–46, pl. xi, fig. 3; *cæcus* (Pack.), Weyer's Cave, pp. 46–48, pl. xi, fig. 4; PACKARD (2).

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List of the genera of *Arthrolycosida*, p. 197.

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The hypopial stage exists in *Glyciphagus* as it does in *Tyroglyphus*, but is far less developed, and appears to be inactive. Pl. xvi, *G. domesticus*, figs. 1-8; *spinipes*, figs. 8-15.

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IXODIDÆ.

Hæmaphysalis peregrinus, n. sp., on the sand-grouse (*Syrhaptus paradoxus*), p. 406; CAMBRIDGE.

Hæmaphysalis sulcata (Can. & Fan.) on the green-lizard, pt. lv, No. 1; BERLESE (1).

Gecobias, pt. lv, No. 2; *id. t. c.*

Hyalomma, pt. lv, No. 3; *id. t. c.*

Hyalomma utriculus, n. sp., Arambo, p. 300, pl. vii, figs. 1-4; *id.* (2).

Ixodes, pt. lv, No. 6, *crenulatus* (Koch), on the badger and otter, No. 4; *ovinus* (Berl.), on Passerine birds, No. 5; *id.* (1).

Phauloizodes rufus (Koch), on the sheep and deer, pt. lv, No. 7; *plumbeus* (Fanz.), on Passerine birds, No. 8; *id. t. c.*

Rhipicephalus, pt. lv, No. 9, *bursa* (Can. & Fan.), on the wild boar and sheep, No. 10; *id. t. c.*

Argas echinsei, n. sp., Arambo, p. 298, pl. vii, figs. 5 & 6; *id.* (2).

GAMASIDÆ.

Gamasus (or *Hypoaspis*) *troglodytes*, n. sp., Mammoth Cave, p. 42, pl. x, fig. 4; *stygius*, n. sp., Bat Cave, fig. 5; PACKARD.

Holostaspis merdarius, n. sp. (protonymph of *marginatus*), pt. lii, No. 1; *badius* (Koch) (tritonymph of *marginatus*), syn. *G. heringi* (Hall.), *G. carinatus* (Koch), No. 3; *marginatus* (Herm.), syn. *tardus*, *latus* (C. Koch), *favosa* (Müll.), *copromorgus* (Mégn.), pts. iv-vi; *alpinus* (Berl.), var. *terreus* (Can. & Fan.), No. 7; *vagabundus*, n. sp., No. 8: all from Italy; BERLESE (1).

Hæmogamasus, n. g., pt. lii, No. 10, *hirsutus*, n. sp., No. 2, on the mole, Italy, No. 2; *id. t. c.*

Dermanyssus, pt. liii, No. 4, *gallinæ* (Redi.), on domestic birds, pt. liii, No. 1; *passerinus* (Berl. & Trt.), on the house sparrow, No. 2; *hirundinis* (Herm.), on swallows, No. 3; *id. t. c.*

Leiognathus berlesii, n. sp., Italy, pp. 142-143; CANESTRINI (1).

Leiognathus, pt. liii, No. 9; *sylviarum* (Can. & Fan.), on *Sylvia atricapilla*, No. 5; *albatus* (Koch), on the common mole, No. 6; *uncinatus*

(Can.), on *Rhynolophus euryale*, No. 7; *arcuatus* (Koch), syn. *pteroptoides*, *dermanyssoides* (Még.) *lanius* (Can.), on bats, No. 8; BERLESE (1).

Ptilonyssus, pt. liv, No. 1, *nudus* (Berl. & Trt.), on the house sparrow, pt. liii, No. 10; *id. t. c.*

Pteroptus, pt. liv, No. 4; *vespertilionis* (Linn.), on bats, No. 2; *euryalis* (G. Can.), on *Rhynolophus euryale*, No. 3; *id. t. c.*

Laelaps tumidulus (Koch), in moss, pt. liv, No. 5; *id. t. c.*

Laelaps arvicola, n. sp., on *Arvicola amphibius*, p. 6; GEORGE.

Laelaps (or *Holostaspis*) *wyandottensis*, n. sp., Wyandotte Cave, p. 42, pl. x, fig. 2; *cavernicola*, n. sp., Mammoth Cave, fig. 3; PACKARD.

Iphis astronomicus (Koch), nymph of *L. tumidulus*, syn. *Zorcon ciliatus* and *bolati* (Koch), in moss, pt. liv, No. 6; BERLESE (1).

Seius obtusus (Koch), in moss, pt. liv, No. 7; *sepallidus* (Koch), syn. *viridis* (Még.), *tumidulus* (Can.), on leaves, No. 8; *degenerans*, n. sp., in moss, &c., No. 9; *id. t. c.*

Uropoda ricasoliana, n. sp., in ants' nest, Italy, pt. liv, No. 10; *id. t. c.*

Uropoda lucifugus, n. sp., Wyandotte Cave (on *Pseudotremia*), p. 42, pl. x, fig. 9; PACKARD.

Dumacus (= *Belba*) *bulbipedata*, n. sp., Dixon's Cave, p. 42, pl. x, fig. 7; *id.*

Seius sandborni, n. sp., cave in Kentucky, p. 42, pl. x, fig. 6; *id.*

SARCOPTIDÆ.

? *Myobia*, pt. lvi, No. 1, *musculi* (Schr.), on the house mouse, &c., No. 2; BERLESE (1).

Hyadesia uncinifer, n. g. & sp., Tierra del Fuego, p. 51; MÉGNIN (3).

Myocoptes tenax, n. sp., on the field vole, pp. 401-403, pl. xxvi, figs. 1-7; MICHAEL (2).

Symbiotes tripilis, n. sp., on the hedgehog, pp. 403 & 404, pl. xxvi, fig. 8; *id. t. c.*

? *Goniomerus*, n. g., *musculus*, n. sp., on the field vole, pp. 405 & 406; *id. t. c.*

Cheyletiella, pt. lvi, No. 3, *pinguis*, n. sp., on *Merula nigra*, No. 4; BERLESE (1).

ORIBATIDÆ.

Oribata alata, n. sp., Dixon's Cave, p. 42, pl. xi, fig. 2; PACKARD.

TROMBIDIIDÆ.

CANESTRINI (2) describes the following from Italy, under the subfamily *Tetranychini* :—

Tetranychus, *Bryobia*, *Tetranychopsis*, n. g., *Raphignathus*, *Stigmaeodes* n. g., *Stigmaeus*, *Tenuipalpus*, *Neophyllobius*, *Mediolata*, n. g., *Cryptogma*, *thus*, *Caligonus*, characterised, pp. 493-497.

Tetranychus telarius (Duf.), p. 497; *latus* (Can. & Fan.), p. 498; *pilosus* (Can. & Fan.), p. 500, pl. x, fig. 36; *gibbosus*, n. sp., p. 501, pl. ix,

fig. 24 ; *picei*, n. sp., p. 502, pl. ix, fig. 25 ; *arauniensis*, n. sp., p. 503, pl. xi, fig. 40.

Tetranychopsis horrida (Can. & Fan.), p. 504.

Bryobia pretiosa (Koch), p. 505.

Raphignathus piger (Schr.), p. 507 ; *clavatus* (Can. & Fan.), p. 508 ; *patrius* (Berl.), p. 509 ; *curtipilus* (Berl.), p. 510 ; *arauniensis*, n. sp., p. 511, pl. ix, fig. 26.

Stigmaeodes elongatus (Berl.), p. 512.

Stigmaeus kermesinus (Koch), p. 513 ; *siculus* (Berl.), p. 514 ; *scapularis* (Koch), p. 515.

Tenuipalpus coronatus (Can. & Fan.), p. 516 ; *lineola* (Can. & Fan.), p. 517 ; *pulcher* (Can. & Fan.), p. 519, pl. x, fig. 28 ; *glaber* (Donn.), p. 519 ; *palmaris* (Donn.), p. 520.

Neophyllobius elegans (Berl.), p. 521 ; *superbus*, n. sp., p. 523, pl. xi, fig. 44.

Mediolata longirostris (Berl.), p. 524 ; *pini*, n. sp., p. 525, pl. xi, fig. 23 ; *arcensis*, n. sp., p. 526.

Cryptognathus lagena (Kram.), p. 526.

Caligonus longimanus (Koch), p. 527 ; *humilis* (Koch), p. 528 ; *cerasinus* (Koch), p. 529 ; *robustus* (Berl.), p. 530 ; *petrobisus*, n. sp., p. 530, pl. xi, fig. 47.

Heteronychus hirtus (Can. & Fan.), p. 533.

Oligonychus brevipodus (Tozz.), p. 534.

Tetranychus telarius (Linn.), on plants, pt. lvi, No. 5 ; *pilosus* (Can. & Fan.), on plants, No. 6 ; *latus* (Can. & Fan.), on plants, No. 7 ; BERLESE (1).

Trombidium grandissimum (Koch), syn. *barbatum* (Koch), Arambo, p. 301, pl. vii, figs. 7-11 ; *id.* (2).

Rhyncholophus cavernarum, n. sp., White's Cave, p. 42, pl. x, fig. 1 ; PACKARD.

Bryobia (or *Penthaleus*) *weyerensis*, n. sp., Weyer's Cave, p. 42, pl. xi, fig. 1 ; *id.*

PHYTOPTIDÆ.

Acanthonotus, n. g., *heptacanthus*, n. sp., p. 116 ; NALEPA.

Phytoptus, Duj., p. 121, *pini*, Nal., p. 122, pls. i, figs. 1-3, & ii, figs. 4 & 5 ; *avellanae*, n. sp., p. 126, pls. ii, figs. 1-3, & iii, fig. 3 ; *vermiformis*, n. sp., p. 129, pl. iii, figs. 1 & 2 ; *brevipunctatus*, n. sp., p. 130, pl. iv, figs. 1-3 ; *macrotrichus*, n. sp., p. 132, pl. v, figs. 4-7 ; *thomasi*, n. sp., p. 135, pl. vi, figs. 1-3 ; *macrorhynchus*, n. sp., p. 137, pls. vii, fig. 6, & viii, figs. 1 & 2 ; *viburni*, n. sp., p. 138, pls. viii, figs. 3 & 4 & vii, fig. 5 ; *goniothorax*, n. sp., p. 140, pls. viii, figs. 5 & 6, & ix, fig. 3 ; *id.*

Cecidophyes, n. g., *galii*, n. sp., p. 142, pls. iii, fig. 5, & iv, figs. 4-6 ; *tetanolhris*, n. sp., p. 145, pl. vii, figs. 1-4 ; *schmarke*, n. sp., p. 147, pl. ix, figs. 1 & 2 ; *id.*

Phyllocoptes, n. g., *carpini*, n. sp., p. 148, pl. v, figs. 1-3 ; *thynni*, n. sp., p. 152, pl. vi, figs. 4-6 ; *loricatus*, n. sp., p. 153, pl. iii, fig. 4 ; *id.*

HYDRACHNIDÆ

Arrhenurus maculator (Müll.), syn. *viridis* (Dug.), Padova, pt. lii, No. 9 ; BERLESE (1).

Teutonia, n. g., *primaria*, n. sp., p. 104 ; KOENIKE (1).

Nesoa nucata, n. sp., p. 273, pl. iii ; *id.* (3).

Asperia lemani (Hall.) is the female, and *Nesoa kamiki* (Hall.) the male of *Midea elliptica* ; SCHAUB.

For further information respecting this family, see papers by BARROIS (1, 2), GIROD, KOENIKE (2, 4), KRAMER, MONIEZ (2).

HALACARIDÆ.

Simognathus, n. g., for *sculptus* (Brady), referred to the genus *Packygnathus*, p. 162 ; TROUSSERT (1).

Halacarus levipes, n. sp., Mediterranean, p. 162 ; *id. t. c.*

Leptopsalis chevreuzy, n. sp., Croisic, p. 162 ; *id. t. c.*

Rhombognathus magnirostris, n. sp., Mediterranean, p. 181 ; *id.* (2).

Agas brevipalpis, n. sp., S. Atlantic, Mediterranean ; *hirsuta*, n. sp., and *microrhyncha*, n. sp., Mediterranean, p. 181 ; *id. t. c.*

TROUSSERT (3) describes the following :—

Rhombognathus, syn. *Aletes*, Lohm., *pascens* (Lohm.), coasts of France and Baltic ; *seahami*, p. 229, *setosus* (Lohm.), Baltic ; *nigrascens* (Brady), Northumberland, p. 230 ; *notops* (Gosse), Baltic, English and French seas, p. 231 ; *magnirostris* (Trt.), Mediterranean, n. var. *phumifer*, Cape Horn, and Tierra del Fuego, p. 231 ; *minutus* (Hodge), Northumberland, p. 232.

Simognathus (Trt.) characterised, *sculptus* (Brady), coasts of England and France, p. 232.

Coloboceras, n. g., p. 233, *longiusculus*, n. sp., coasts of France, p. 233.

Halacarus (Gosse), p. 234 ; *parvirostris*, n. sp., coasts of New Zealand, p. 235 ; *murrayi* (Lohm.), Baltic, *levipes* (Trt.), Mediterranean, p. 236 ; *floridearum* (Lohm.), Baltic, *balticus* (Lohm.), coasts of France, Baltic, p. 237 ; *striatus* (Lohm.), syn. *inermis* (Trt.), coasts of France and England, Baltic, p. 238 ; *spinifer* (Lohm.), syn. *globosus*, *ctenopus*, in pt. (Trt.), coasts of France and Baltic, p. 238 ; *ctenopus*, Gosse, coasts of France and England ; *actenos*, n. sp., coasts of France, p. 239 ; *harioti*, n. sp., coast of Cape Horn, p. 240 ; *fabricii* (Lohm.), coast of France, Baltic ; *glyptoderma* (Trt.), coast of France, p. 241 ; *lohmanni*, n. sp., coast of New Zealand ; *rhodostigma* (Gosse), coasts of France and England, p. 242 ; *gracilipes*, n. sp., coast of France, England ; *oculatus* (Hodge), coast of France, England, Baltic, p. 243 ; *gibbus*, n. sp., coast of France, p. 244.

Leptopsalis (Trt.), p. 244 ; *longipes* (Trt.), coast of France, p. 244 ; *chevreuzi* (Trt.), coast of France, p. 245 ; *olivaceus* (Grube), p. 245 (in note) ; *parvus* and *truncipes* (Chilton), New Zealand, p. 246 (in note).

Agas (Lohm.), p. 246 ; *brevipalpis* (Trt.), coasts of France ; *hirsuta* (Trt.), Mediterranean, p. 247 ; *microrhyncha* (Trt.), Mediterranean ; *cryptorhyncha*, n. sp., coast of Tierra del Fuego, p. 248.

Scaptognathus, n. g., p. 249, *tridens*, n. sp., Le Croisic (France), p. 249.

Leptognathus (Hodge), p. 249 ; *falcatus* (Hodge), coast of France and

England; *marinus* (Lohm.), coast of France and Baltic; *violaceus* (Kram.), Thüringen, p. 250.

Synopsis of the genera, p. 251.

PANTOPODA.

ADLERZ, G. Bidrag till Pantopodernas Morfologi och Utvecklingshistoria. Bih. Sv. Ak. Handl. xiii, No. 11, pp. 12-25, pls. i & ii.

GRIEG, J. A. Undersøgelser over Dyrclivet i de Vestlandske Fjorde. Bergens Mus. Aarsber. 1888 (1889), pp. 3-10.

Pantopoda, p. 10; 4 species recorded.

PENTASTOMIDA.

BABES, V. Die Wanderungen des *Pentastomum denticulatum* beim Rinde. CB. Bakt. Parasit. v, pp. 1-5.

The connection pointed out between *P. denticulatum* and the cattle disease known as hæmogloburinia.

IVES, J. E. *Linguatula diesingii* from the sooty Mangabey [*Cercocebus fuliginosus*]. P. Ac. Philad. 1889, p. 31.

LOHRMANN, E. Untersuchungen über den anatomischen Bau der Pentastomen. Arch. f. Nat. 1889, pp. 303-336, pl. xvi.

A full account of the anatomy of the group. The following new species described on p. 336:—*P. platycephalum*, fig. 13, from Alligator; *claratum*, fig. 12, from *Monitor niloticus*.

GIGANTOSTRACA.

AMI, H. M. Notes on Fossils from the Utica formation at Point-à-Pic, Murray River, Murray Bay (Quebec), Canada. Can. Rec. iii, pp. 101-106.

Trilobites, pp. 103 & 106.

BARROIS, CH. Faune du Calcaire d'Erbray (Loire inférieure), *Trilobites*. Mém. Soc. Lille, 1889, pp. 232-248, pl. xvii.

Harpes venulosus, Corda, p. 232, pl. xvii, fig. 1.

Bronteus servillei, Barr., p. 232, fig. 2.

Cheirurus sternbergi, Boeck, p. 235, fig. 3.

Cryphæus pectinatus, Ræmer, p. 236, fig. 4.

Proetus bohemicus, Corda, p. 239, fig. 5; *fullax*, Barr., p. 241, fig. 6; *ligertensis*, n. sp., p. 242, fig. 7; *gosseleti*, n. sp., p. 244, fig. 8; *cornutus*, Gold., p. 245, fig. 9; *vicinus*, Barr., p. 246, fig. 10.

HERRICK, C. L. Geology of Licking County, Ohio. Pt. iv. List of Waverley Fossils continued. Bull. Denison Univ. iv, pp. 49-59.

Phillipsia, p. 52, *serraticaudata*, n. sp., p. 52, pl. i, fig. 8; *consors*, n. sp., p. 53, pl. i, fig. 16; *meramecensis* (Shum.), p. 54, pl. i, fig. 6; *auriculatus* (Hall.), syn. *missouriensis* (Shum.), *shumardi* (Herr.), p. 54, pl. i, fig. 14; *precursor* (Herr.), p. 54, pl. i, fig. 1.

Proetus, pp. 52 & 55, *haldermani* (Herr.), p. 55, pl. i, fig. 12; *minutus*, n. sp., p. 56, pl. i, fig. 7.

Phaethonides, p. 56, *occidentalis*, n. sp., p. 57, pl. i, fig. 10; *spinosus*, n. sp., p. 58, pl. i, figs. 4 & 5; *immaturus*, n. sp., p. 59, pl. i, figs. 9 & 15; *lodiensis* (Meek), p. 59.

Notes upon the Waverley Group of Ohio. *Am. Geol.* 1889, pp. 94-99.

The following species figured on pl. i:—

Proetus precursor, *minutus*.

Phaethonides spinosus, *immaturus*, *occidentalis*.

Phillipsia meramecensis, *serraticauda*, *auriculatus*, *consors*.

MATTHEWS, G. F. On the Classification of the Cambrian Rocks of Acadia. *Can. Rec.* iii, pp. 71-80.

A discussion of the affinities of *Olenellus*, *Paradoxides*, *Derepyxis*, &c., pp. 75-77.

— On some Remarkable Organisms of the Silurian and Devonian Rocks in Southern New Brunswick. *Tr. R. Soc. Canada*, vi (1888), pp. 49-61.

Bumodella, n. g., *horrida*, n. sp., p. 56, pl. iv, fig. 8.

Eurypterella, n. g., *ornata*, n. sp., p. 60, pl. iv, fig. 12.

MILLER, S. A. North-American Geology and Palaeontology, &c. Cincinnati, Ohio: 1889.

The genera of *Crustacea* (including *Trilobita*, *Eurypterida*) characterised in alphabetical order, with a list of the species belonging to each, and references to literature, pp. 525-569.

NICHOLSON, H. A., & LYDEKKER, R. A Manual of Palaeontology. London: William Blackwood & Sons, 1889.

Trilobites, pp. 516-546. *Merostomata*, pp. 547-555.

SAFFORD, J. M., & VOGDES, A. W. Descriptions of New Species of Fossil *Crustacea* from the Lower Silurian of Tennessee, with Remarks on others not well known. *P. Ac. Philad.* 1889, pp. 166-168.

Ampyz americanus, n. sp., p. 166, with fig.

Encrinurus varicosatus, Walc., syn. *excredrinus*, Saff., p. 167, fig.

Chasmops troosti, Saff., pp. 167 & 168, fig.

WALCOTT, C. D. Description of New Genera and Species of Fossils from the Middle Cambrian. *P. U. S. Nat. Mus.* 1888, pp. 441-446.

Olenoides, Meek, notice of, pp. 442 & 443; *curticei*, n. sp., Cherokee Co., pp. 443 & 444, fig.; notice of an unknown species, p. 444.

Karlia, n. g., p. 444; *minor*, n. sp., Newfoundland; *stephenensis*, n. sp., British Columbia, p. 445.

Bathyuriscus (*Kootenia*) *dawsoni*, n. sp., British Columbia, p. 446.

Ogygopsis, n. g., for *Ogygia klotzi*, Rominger, p. 446.

WALCOTT, C. D. Stratigraphic Position of the *Olenellus* Fauna in N. America and Europe. Am. J. Sci. (3) xxxvii, pp. 374-392, and xxxviii, pp. 29-42.

Trilobites, p. 37.

WINCHELL, N. H. Notice of the discovery of *Lingula* and *Paradoxides* in the Red Quartzites of Minnesota. Bull. Minnesota Acad. 1889, pp. 103 & 104.

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MYRIOPODA.

BY

R. INNES POCKOCK.

ANATOMY, PHYSIOLOGY, &c.

BALBIANI, —. Sur trois Entophytes Nouveaux du Tube Digestif des Myriopodes. J. de l'Anat. Phys. xxv, pp. 5-45, pls. i & ii.

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CHALANDE, J. Sur la présence de Filières chez les Myriopodes. C.R. cviii, pp. 106-108; Ann. N. H. (6) iii, pp. 290 & 291.

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* An asterisk prefixed to a quotation indicates that the Recorder has not seen the Journal or Work referred to.

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List of *Myriopoda* from Udine.

DISTRIBUTION.

PALEARCTIC.

Britain and Jersey. Marine *Geophili*; "D. W. T.", PARFITT, POCOCK (4).

4 Myr.

MYRIOPODA.

Scandinavia. PORATH (1).

Heligoland. DALLA TORRE.

Netherlands. EVERTS.

Udine. TOML.

N. Italy. Cave forms; LATZEL (1).

Mediterranean Area. BROLEMAN.

Azores. LATZEL (2).

Hungary and Transylvania. DADAY (1, 2).

Afghanistan. POCKOCK (1).

ORIENTAL.

Mergui Archipelago. POCKOCK (2).

Borneo. 1 species of *Glomeris*; *id.* (3).

NEARCTIC.

Tennessee, Indiana, Bermudas. BOLLMAN (6, 5, 4, 3, 2).

NEOTROPICAL.

Various parts. PORATH (2), *Julida*.

Cuba. BOLLMAN (1).

Various scattered Localities. *Id.* (7).

SYSTEMATIC.

PAUROPODA.

Eurypauropus cycliger (Latz.), syn. *Trachypauropus glomerioides* (Töm.), Déva; *margaritaceus* (Töm.), E. Hungary, p. 789. DADAY (1).

Pauropus huxleyi (Lubb.), Déva, p. 80, *id. t. c.*

SYMPHYLA.

Scolopendrella immaculata (Newp.), *nivea* (Scop.), *notacantha* (Gerv.), Hungary, pp. 81 & 82; DADAY (1).

DIPLOPODA.

POLYXENIDÆ.

Polyxenus lagurus (Linn.), Hungary, p. 78; DADAY (1); BERLESE, pt. lvi, No. 8, from Italy.

GLOMERIDÆ.

Glomeris carnifex, n. sp., Tenasserim, p. 290, n. var. *pallida*, Mergui, p. 290, pl. xxiv, fig. 7; POCKOCK (2).

Glomeris pallida, n. sp., Borneo, p. 474; *id.* (3).

Glomeris inferorum, n. sp., Mondovi (in cave), p. 361 ; LATZEL (1).

Glomeris minima (Latz.), *pustulata* (Latr.), *pulchra*, *conveza*, *ornata*, *multistriata* (C. K.), *hexasticha* (Br.), *conspersa* (C. K.), *simplex* (Töm.), *tyrolensis* (Latz.), *marginata* (Vill.), recorded from Hungary and characterized, pp. 73-77 ; DADAY (1).

Gervaisia costata (Waga), Hungary, p. 73 ; *id. t. c.*

POLYDESMIDÆ.

Polydesmus troglobius, n. sp., Mondovi (in cave), p. 360 ; *barberii*, n. sp., Sestri Ponente, Isoverde (in cave), p. 361, fig. 2 ; LATZEL (1).

Polydesmus complanatus (Linn.), *denticulatus* (C. K.), syn. *acutangulus* (Menge), *coriaceus* (Porath), n. var. *borealis* : recorded from Scandinavia and described, pp. 20, 21, & 58 ; PORATH (1).

Polydesmus edentulus, *macilentus*, *collaris*, *denticulatus* (C. K.), *tatranus*, *subcabratus* (Latz.), *complanatus* (Linn.), and *albidus*, *montanus*, *transylvanicus*, *banaticus*, n. spp. : recorded from Hungary and described ; DADAY (1, 2).

Scytonotus digitatus, n. sp., Scandinavia, p. 25 ; PORATH (1).

Brachydesmus prozimus, n. sp., St. Miguel (Azores), p. 405 ; LATZEL (2).

Brachydesmus superus (Latz.), Scandinavia, p. 26 ; PORATH (1).

Brachydesmus filiformis, *subterraneus*, *inferus*, *superus* (Latz.), and *hungaricus*, *troglobius*, *chyzeri*, n. spp. : recorded from Hungary and described, pp. 70-72 ; DADAY (1, 2).

Paradesmus gracilis (C. K.), recorded from Scandinavia and described ; PORATH (1) : from Hungary, p. 66 ; DADAY (1).

Paradesmus poeyi (Bollman), sub. *Strongylosoma*, ? syn. *P. vicarius* (Karsch), Cuba, p. 336 ; BOLLMAN (1).

Paradesmus karschi, n. sp., Mergui, p. 293, pl. xxiv, fig. 5 ; *crucifer*, n. sp., Mergui, p. 293, fig. 6 ; POCOCK (2).

Strongylosoma pallipes (Oliv.), p. 65, n. varr. *fulvum*, *albidum*, *fuscum*, *flavum*, Hungary, p. 66 ; DADAY (1).

Fontaria tennesseensis, n. sp., Tennessee, p. 340 ; BOLLMAN (2) : *crassiscutis* (Wood), p. 344, Georgia ; *georgiana*, n. sp., Georgia, p. 344 ; *tallulah*, n. sp., Georgia, p. 344 ; *rileyi*, n. sp., Georgia, p. 345 ; *id.* (3) : *virginiensis* (Drury), syn. *P. butleri* (McNeill) ; *indiana*, n. sp., Indiana, p. 406 ; *butleriana*, n. sp., Indiana, p. 407 ; *id.* (4) : *pulchella*, n. sp., Tennessee, p. 316 ; *id.* (6).

Euryurus erythropyus (Br.), n. subsp. *australis*, Georgia, p. 345 ; BOLLMAN (3).

Stenonia (*Platyrrhacus*) *maculata*, n. sp., Cuba, p. 336 ; *id.* (1).

Stenonia (*Acanthodesmus*) *pilipes* (Peters), Mergui, p. 291, pl. xxiv, fig. 4 ; POCOCK (2).

Rhacophorus magnus, n. sp., Cuba, p. 336 ; BOLLMAN (1).

CHORDEUMIDÆ.

Chordeuma silvestre (C. K.), Hungary, p. 62 ; DADAY (1).

Craspedosoma flavescens, *mutabile* (Latz.), *rawlinsii* (Leach), Hungary, p. 63 ; *id. t. c.*

- Atractosoma hyalops*, n. sp., Liguria (in caves), p. 362 ; LATZEL (1).
Atractosoma bohemicum (Ros.), *athesinum* (Fedr.), *carpathicum* (Latz.), Hungary, p. 64 ; DADAY (1).
Scotherpes wyandotte, n. sp., Indiana, p. 405 ; BOLLMAN (4).
Scotherpes, p. 62, *copei* (Pack.), Mammoth Cave, p. 63, pl. viii, fig. 1 (under *Lysiopetalidæ*) ; PACKARD.
Pseudotremia, p. 60, *cavernarum* (Cope), Wyandotte Cave, p. 61, pl. vi, figs. 1 & 2 (under *Lysiopetalidæ*) ; *id.*
Pseudotremia carterensis (Pack.), Indiana, p. 405 ; BOLLMAN (4).
Zygonopus, p. 63, *whitei* (Ryder), Weyer's Cave (Virginia), p. 64, pl. vii, fig. 1 (under *Lysiopetalidæ*) ; PACKARD.

LYSIOPETALIDÆ.

- Lysiopetalum degenerans*, *illyricum*, *fasciatum* (Latz.), recorded from Hungary and described, p. 61 ; DADAY (1).
Lysiopetalum, pp. 58 & 59, *lactarium* (Say), N. America (in caves), p. 59, pl. ix, fig. 13 ; PACKARD.

JULIDÆ.

- Cambala*, p. 64, *annulata* (Say), p. 65, pl. ix, fig. 1, N. America (in caves), (referred to the *Lysiopetalidæ*) ; PACKARD.
Julus punctatus (Leach) ; *fatidus* (C. K.) ; *londinensis* (Leach) ; *luscus* (Mein.) ; *pusillus* (Leach) ; *sabulosus* (Linn.) ; *fasciatus* (C. K.), syn. *sjelandicus* (Mein.), *austriacus* (Latz.) ; *silvarum* (Mein.), syn. *memorensis* (Menge), *luridus* (Por.), *cornutus* (Voges), *luridus* var. *gracilis* (Latz.) ; *terrestris* (Linn.), syn. *terrestris* (Por.), *rugifrons* (Mein.), non syn. *terrestris* (Mein.), *scandinavicus* (Latz.), *terrestris* (Haase) ; *vagabundus* (Latz.), syn. *fallax* (Karl. & Haase), *terrestris* (Berl.) ; *fallax* (Mein.), syn. *longabo* (Latz.), non syn. *fallax* (Latz. & Haase) ; *laticollis*, n. sp., syn. in part *ferrugineus* (C. K.) and *fallax* (Mein.) ; *minutus*, n. sp., syn. in part *fallax* (Mein.) : from Scandinavia, pp. 32-52 & 58-60 ; PORATH (1).
Julus strictus, *nanus*, *pelidnus*, *dicentrus* (Latz.), *occultus* (C. K.), *pusillus* (Leach), *luscus* (Mein.), *boleti*, *flavipes*, *fatidus* (C. K.), *cattarensis*, *plutyrus*, *podabrus* (Latz.), *varius* (Fabr.), *unilineatus* (C. K.), *austriacus* (Latz.), *sabulosus* (Linn.), *trilineatus* (C. K.), *montivagus* (Latz.), *longabo* (C. K.), *fallax* (Mein.), *rugifrons* (Mein.), *scandinavicus* (Latz.), *fuscipes* (C. K.), *hungaricus* (Karsch) and *őrmösváryi*, *frivaldskyi*, *transylvanicus*, n. spp., recorded and described from Hungary, pp. 47-58 ; DADAY (1).
Blaniulus fuscus (Stein) ; *pulchellus* (C. K.) ; *guttulatus* (Bosc), Scandinavia, pp. 28-32 & 61 ; PORATH (1).
Blaniulus guttulatus (Gerv.), *venustus* (Mein.), *fuscus* (Stein), Hungary, described, pp. 58 & 59 ; DADAY (1).
Blaniulus hirsutus, n. sp., Mentone, p. 279, pl. i, figs. 5-9 ; BROLEMAN.
Isobates varicornis (C. K.), recorded from Hungary and described, p. 60 ; DADAY (1).
Spirostreptus javanicus (Br.), syn. *collaris* (Porath), *segmentatus* (Voges), Java, Amboina, p. 209 ; *torquatus*, n. sp., Batavia, p. 211 ; *armatus*, n. sp.,

Java, p. 213; *fuscipes*, n. sp., Bahia, p. 214; *aequatorialis*, n. sp., Ecuador, p. 215; *volzemi*, n. sp., Theresopolis, p. 216; *occæratatus*, n. sp., Pedro de Cerra, Brazil, p. 217; *tristis*, n. sp., Pedro Acu, Brazil, p. 218; *corticus*, n. sp., Amboina, Sumatra, p. 219; *torifer*, n. sp., Theresopolis, p. 221; *patruelis*, n. sp., Theresopolis, p. 222; *papillaris* (Por.), ? syn. *punctulatus* (Kar.), Brazil, p. 223; *corrugatus*, n. sp., Guatemala, p. 225; *microps*, n. sp., Brazil, p. 226; *fartus*, n. sp., Brazil, p. 227; *ventralis* (Porath), Theresopolis, p. 228; *liber*, n. sp., Liberia, p. 230; *vulgatus*, n. sp., Theresopolis, p. 231; PORATH (2).

Spirostreptus (Nodopyge) opinatus (Karsch), Mergui, p. 294, pl. xxv, fig. 2; *aterrimus*, n. sp., Mergui, p. 295, fig. 1; *regis*, n. sp., Mergui, p. 297, fig. 3; POCOCK (2).

Spirobolus (Rhinocricus) lætus (Kar.), Caraccas, p. 234; *insculptus*, n. sp., Ecuador, p. 235; *omentatus*, n. sp., Ecuador, p. 236; *argentineus*, n. sp., Buenos Ayres, p. 238; *nattereri* (Sausa.), Buenos Ayres, p. 239; *adstrictus*, n. sp., Ecuador, p. 241; (*sensu stricto*) *politus*, n. sp., Antigua, p. 243; *goesi* (Por.), Borneo, Sumatra, p. 245; *giganteus* (Por.), Liberia, p. 246; *arimius*, n. sp., Guatemala, p. 248; *reptans*, n. sp., Guanajuato, p. 250; *insulanus*, n. sp., New Caledonia, p. 251; *albidicollis*, n. sp., New Caledonia, p. 252; *pulcher*, n. sp., New Caledonia, p. 254; *punctifrons*, n. sp., New Caledonia, p. 254; PORATH (2).

Spirobolus caudulanus (Karsch), Mergui, p. 297, pl. xxv, fig. 4; *phranus* (Karsch), Mergui, p. 298, fig. 6; *andersoni*, n. sp., Mergui, p. 299, fig. 5; POCOCK (2).

Spirobolus heilprini, n. sp., Bermuda, p. 127; BOLLMAN (5).

Spirobolus sanctæ-luciæ, n. sp., S. Lucia, p. 211; *id.* (7).

Alloporus longicornis, n. sp., Theresopolis, p. 256; PORATH (2).

Nannolene cubensis, n. sp., Cuba, p. 335; BOLLMAN (1).

POLYZONIDÆ.

Siphonophora portoricensis (Br.), syn. *cubana* (Karsch), Cuba, p. 335; BOLLMAN (1).

Andrognathus corticarius (Cope), Tennessee, p. 339; *id.* (2).

Polyzonium germanicum (Br.), Hungary, p. 45; DADAY (1).

CHILOPODA.

SCUTIGERIDÆ.

Scutigera coleoptrata (Linn.), Hungary, described, pp. 103 & 104; DADAY (1).

LITHOBIIDÆ.

Hemicops fulvicornis (Mein.), Kazán, p. 93; DADAY (1).

Lithobius characterized; BERLESE, pt. lvi, Nos. 9 & 10.

Lithobius forficatus (Linn.); *nigrifrons* (Latz. & Haase); *glabratus* (C. K.), var. *hebesens* (Porath); *borealis* (Mein.); *curtipes* (C. K.);

crassipes; *erythrocephalus* (C. K.); *microps* (Mein.); *calcaratus* (C. K.): recorded from Scandinavia and characterized, pp. 4-10 & 54; PORATH (1).

Lithobius æruginosus, *crassipes* (L. K.), *eximius* (Mein.), *lucifugus* (L. K.), *dadayi* (Töm.), *muticus*, *erythrocephalus* (C. K.), *dubius* (Töm.), *pusillus* (Latz.), *lapidicola*, *microps*, *latro* (Mein.), *calcaratus* (C. K.), *mutabilis* (L. K.), *pelidnus* (Haase), *cyrtopus* (Latz.), *borealis* (Mein.), *glabratus*, *dentatus*, *agilis* (C. K.), *aulacopus*, *anodus* (Latz.), *tricuspis* (Mein.), *nigrifrons* (Latz.), *piceus* (L. K.), *peregrinus*, *dalmaticus* (Latz.), *forficatus* (auct.), *bonensis*, *validus* (Mein.), *tridentinus* (Fanz.), *leptopus*, *transylvanicus* (Latz.), *grossipes* (C. K.), recorded from Hungary and characterized, pp. 94-103. The following n. spp. also described:—*entzii*, Gálszécs, p. 99; *hungaricus*, Felesúth, p. 101; *tenuipes*, Fiume, p. 102; *brevicornis*, Plavisevicza, p. 103; DADAY (1).

Lithobius grossipes (C. K.), n. var. *debilis*, Mondovi (in caves); LATZEL (1).

Lithobius cæculus, n. sp., Milan, p. 271, pl. i, fig. i; *hexodus*, n. sp., Brianza, p. 276, pl. i, figs. 2-4; BROLEMAN.

Lithobius similis (Bollman) is synonymous with *L. trilobus* (Bollman); BOLLMAN (2).

Lithobius obesus (Stux.), Salt Lake City, p. 347; *elatus*, n. sp., Virginia, p. 348; *kochi* (Stux.), Colorado, p. 348; *atkinsoni* (Bollman), Georgia, p. 349; *zenopus*, n. sp., Georgia; *latzeli* (Mein.), Virginia, p. 349; *underwoodii*, n. sp., Georgia; *rex*, n. sp., Georgia, p. 350; *id.* (3).

Lithobius jowensis (Mein.), Indiana; *bilabiatus* (Wood), syn. *tuber* (Bollman); *id.* (4).

SCOLOPENDRIDÆ.

Scolopendra macrucantha, n. sp., W. of S. America, p. 213; *micrucantha*, n. sp., Lower California, p. 214; *galapagoensis*, n. sp., Galapagos, p. 215; BOLLMAN (7).

Scolopendra truncaticeps, n. sp., Meshed, p. 119, pl. xiii, fig. 7; POCOCK (1).

Scolopendra dalmatica (C. K.) and *cingulata* (Latr.) recorded from Hungary and characterized, pp. 92 & 93; DADAY (1).

Opisthemea erythrocephalum (C. K.), Buccari, p. 92; *id. t. c.*

Cryptops hortensis (Leach), *punctatus* (C. K.), Hungary, p. 91; *id. t. c.*

Newportia longitarsis (Newp.), Cuba, described, p. 337; BOLLMAN (1).

Scolopocryptops sexspinosus (Say), syn. *georgicus* (Mein.), Georgia, Virginia, p. 347; *id.* (3).

GEOPHILIDÆ.

Geophilus sodalis, *truncorum* (Mein.), *proximus* (C. K.), *flavus* (De Geer), syn. *longicornis* (Leach), *electricus* (Linn.), *proximus* (C. K.), recorded from Scandinavia, pp. 14-16 & 56; PORATH (1).

Geophilus linearis (C. K.), *sodalis* (Mein.), *electricus* (Linn.), *arenarius*

(Mein.), *longicornis* (Leach), *proximus* (C. K.), *pygmaeus* (Latz.), *flavidus* (C. K.), *ferrugineus* (C. K.), *mediterraneus* (Latz.), Hungary, pp. 85-88; DADAY (1).

Geophilus virginienensis, n. sp., Virginia, p. 346; *smithi*, n. sp., Washington, p. 347; BOLLMAN (3).

Geophilus (Schendyla) nemorensis (C. K.), *eximia* (Mein.), Hungary, pp. 88; DADAY (1).

Pectiniunguis, n. g., near *Schendyla*, *americanus*, n. sp., Gulf of California, p. 212; BOLLMAN (7).

Nannopus, n. g., for *eximia* (under *Schendyla*), (Mein.), p. 213; *id. t. c.*

Linotenius (Scoliopterus) crassipes (C. K.), *acuminatus* (Leach), Hungary, pp. 89 & 90; DADAY.

Linotenius (Scoliopterus) crassipes (C. K.), p. 11; *maritima* (Leach), p. 12, Scandinavia; PORATH (1).

Linotenius fulva (Sæger) sub *Strigamia*, syn. *S. bothriopus* (Wood), p. 341; BOLLMAN (2).

Mecistocephalus punctifrons (Newp.), syn. *M. heros* (Mein.), Mergui, p. 288; POCKOCK (2); also from Cuba, p. 337; BOLLMAN (1).

Mecistocephalus carniolensis (C. K.), syn. *hungaricus* (Töm.), Hungary, p. 90; DADAY (1).

Orphnæus brevilabiatus (Newp.), syn. *G. bilineatus* (Peters), Mergui, p. 289, pl. xxiv, fig. 2; POCKOCK (2).

Himantarium indicum (Mein.), Mergui, p. 289, pl. xxiv, fig. 3; *meinerti*, n. sp., Mergui, p. 289, fig. 1; *id. t. c.*

Himantarium tenuatum (Mein.), syn. *G. barbaricus* (Newp.), Meshed, p. 120, pl. xiii, fig. 8; *id. (1)*.

Himantarium gabrielis (Linn.), Hungary, p. 83; DADAY (1).

Dignathodon microcephalum (Luc.), Hungary, p. 83; *id. t. c.*

Scotophilus bicarinatus (Mein.), *illyricus* (Mein.), Hungary, pp. 84 & 85; *id. t. c.*

PALÆONTOLOGY.

MILLER, S. A. North-American Geology and Palæontology. Cincinnati: 1889. *Myriopoda*, pp. 572-574.

The following genera characterised, with list of species and references to literature: *Acantherpestes*, *Amynilipes*, *Anthracerpes*, *Archæoscoler*, *Archilus*, *Eileticus*, *Euphoberia*, *Palæocampa*, *Trichiulus*, and *Xylobius*.

NICHOLSON, H. A., & LYDEKKER, B. Manual of Palæontology. Vol. I. William Blackwood & Sons, 1889.

Myriopoda, pp. 580-585.

PROTRACHEATA.

DENDY, A. *Peripatus* in Victoria. Nature, xxxix, p. 366.

Note of an apparently new species of the genus.

HAASE, E. Ueber die Bewegungen von *Peripatus* [*Peripatus capensis*].
SB. nat. Fr. 1889, pp. 148-151.

The movements compared with those of *Myriopoda*.

KENNEL, J. Ueber die frühesten Entwicklungsstadien der südamerikanischen *Peripatus*-Arten. Eine Entgegnung. SB. Ges. Dorp. viii, pp. 428-439.

NICOLAS, A. Sur les rapports des Muscles et des Elements Épithéliaux dans le Pharynx du Péripate (*Peripatus capensis*). Rev. Biol. ii, pp. 81-97, pl. i.

SAINT-REMY, G. Sur la Structure du Cerveau chez les Myriopodes et les Arachnides. T. c. p. 55.

Note on the brain of *Peripatus*.

SEDGWICK, A. *Peripatus* in Australia. Nature, xxxix, pp. 412 & 413.

Doubts expressed as to the distinctness of the form obtained in Victoria by Mr. Dendy.

SHELDON, L. (1) On the development of *Peripatus novæ-zelandiæ*. Q. J. Micr. Soc. xxix, pp. 283-293, pls. xxiv-xxvi.

— (2) The Maturation of the Ovum in the Cape and New Zealand Species of *Peripatus*. *Op. cit.* xxx, pp. 1-29, 3 pls.

A detailed account of the structure and development of the ovum in *P. capensis*, *P. balfouri*, and *P. novæ-zelandiæ*. The last named differs considerably from the S. African species. The paper also contains remarks as to the significance of the polar bodies, &c.

INSECTA.

BY D. SHARP.

THE amount of entomological literature in 1889 is similar to that of previous years; this is shown by the number of Titles, which is 948 for 1889 as against 941 in 1888.

Systematic works dealing with Insects of the whole world are but few. WESTWOOD's revision of the *Mantidæ* is of much importance, the figures in the plates being numerous and excellent, and a complete systematic catalogue being included. MOCSARY's monograph of the gold-wasps, *Chrysididæ*, of the world, gives descriptions of 733 species, for which only 13 genera are adopted, and no less than 519 species are included in the one genus *Chrysis*. On the other hand, in KIRBY's work (444) on the subfamily *Libellulinae*—which subfamily is but a fragment of one of the smaller orders of Insects—no less than 88 genera are found to be necessary, and since its publication KARSCH has added (427) several more. HANDLIRSCH (361) on some fossorial *Hymenoptera*, and SCHLETTERER (766) on *Evaniidæ*, though involving each a large amount of work, are restricted to even smaller systematic fragments. LORD WALSLINGHAM, in his monograph of some genera of *Tineidæ* (894), deals with Insects of great interest from their enigmatic and complex systematic affinities. ELWES (222, 223) has given the results of a revision of two extensive genera of Butterflies.

PACKARD's work on cave animals (619) is in large part devoted to Insects, and is remarkable for the number of interesting points it touches on.

Faunistic works have been extremely numerous in 1889. GODMAN & SALVIN's work (324) on Central America, has made satisfactory progress with the *Insecta*. ROMANOFF has added another volume (748) to his series on *Lepidoptera* of Asia. TRIMEN has completed his new edition of the Butterflies of South Africa (870) and SCUDDER (784) his great work on the Butterflies of New England; this latter book is much increased in extent by the subsidiary and digressive matter admitted by the author in addition to the faunistic and descriptive parts. BLACKBURN (73, &c.) has published the results of a large amount of labour on the *Coleoptera* of Australia; SKUSE continues his work (820) on the *Diptera* of the same region; and MEYRICK (568) has completed his series of papers on Australian *Ecophoridae*.

FLER (113) has published, under the auspices of our National Museum, a beautifully illustrated work on a portion of the *Lepidoptera* of a district of northern India. LEECH has continued his work at the *Lepidoptera* of Japan and China. HORN's revision of North American *Halticidæ*, and LEUTIAUX & SALLE's Catalogue, with numerous descriptions, of the *Coleoptera* of Guadeloupe, are each of considerable importance. AITCHISON's work (1) devoted to some districts adjacent to North India, BATES' beetles from Kini-Balu (35), and OLLIFF's (610) on those of Lord Howe Island, are of much interest, though unfortunately in each case only very fragmentary material is dealt with. Many other faunistic papers of more extended extent, or treating of districts that happen at this moment to be of interest, have been published.

Of works on Embryology are those of GRABER (329), HENKING (330), LITZKOW (880, 881), and WHEELER (923). Graber's memoir is very remarkable as insisting on some important points of dissimilarity in the embryology of Insects considered to be systematically related: he says, "Among the few Insects that were investigated with precision, an astonishing multifariousness prevails." Indeed it would appear from the results he has obtained, that a classification on embryological data will be utterly irreconcilable with our present taxonomical system; for example, while some *Orthoptera* and some *Coleoptera* are placed together in one order, some *Coleoptera* must be separated from other *Coleoptera* into distinct orders. EMERY (225) has made some interesting remarks on embryology in his memoir. In anatomy, LOWNE has given papers (527, 528) anticipatory of his more extended work on the Blowfly, MINGAZZINI an elaborate memoir on the alimentary canal in some *Coleoptera*, and JACKSON an interesting sketch (412) relative to the anatomy and development of the bursa copulatrix and oviduct in *Lepidoptera*.

EIMER's speculative work (220) on the phylogeny of some parts of the genus *Papilio* will no doubt be found interesting by many. EMERY's remarks (225) on Graber's embryological and taxonomical views have been above referred to, and GRABER himself has made (328) some valuable observations on the speculative views of Grassi, Haase, and some other authors. HAASE's work (347) on abdominal appendages is accompanied by many theoretical generalizations on phylogeny and other points.

Much attention has been given to the cycles of forms of some *Aphididæ* by BLOCHMANN (86), CHOLODKOVSKY (141), and DREYFUS (198), but the results obtained appear to be as yet by no means complete.

CASEY (137, 138) has described some new Termitophilous forms, which are apparently equally aberrant with those previously known.

Memoirs on points connected with Economic Entomology are very numerous, and frequently include matter of much interest relative to the habits and life histories of Insects.

In Palæontology, the work by BRAUER, GANGLBAUER, & REDTENBACHER on Insects from the Jurassic formation in Siberia is of most importance, while BUTLER's paper (117) on a fossil Moth, and BROGNIART's (104) on a point of distinction between fossil and living *Blattidæ*, are of interest.

BERTKAU's list (61) of described hermaphrodites will no doubt be valued by enquirers on this subject.

As illustrating the difficulties of dealing exhaustively with entomological literature, it may be mentioned that the new Zoological Magazine contains papers on Entomology entirely in the Japanese language; the Recorder regrets he is unable to give any account of these.

In recording entomological literature the most difficult part of the task, next to the multiplicity of the languages used, is the deciding as to what synonymy shall be included. Writers may add considerably to the value of this department of the RECORD by attaching some sign, such as "n. syn.," to any synonymy they give that they think ought to find its way into the pages of the ZOOLOGICAL RECORD.

I.—TITLES.*

AARON, E. M. [See SKINNER & AARON (816).]

1. AITCHISON, J. E. T. The Zoology of the Afghan Delimitation Commission. Tr. L. S. (2) v, pp. 53-142.

Coleoptera, by C. O. WATERHOUSE, pp. 122-131.

Diptera, by C. O. WATERHOUSE, pp. 131 & 132.

Hymenoptera, by W. F. KIRBY, pp. 133-137 & 137-140.

Gall-insects, by G. B. BUCKTON, pp. 141 & 142.

2. ALBARDA, H. Catalogue raisonné et synonymique des *Neuroptères* observés dans les Pays-Bas, et dans les Pays limitrophes. Tijdschr. Ent. xxxii, pp. 210-376.

An exhaustive catalogue, including, besides synonymy, full references and a bibliographical list.

3. —. Notes sur les *Perlides* décrites par le Dr. Rambur. Ann. Ent. Belg. xxxiii, pp. 37-49. [*Neuroptera*.]
4. —. Note sur la *Teniopteryx nebulosa*, L., et la *T. prateata*, Burm. T. c. pp. 51-65, pl. i. [*Neuroptera*.]
5. ALBERS, G. Beitrag zur Kenntniss der *Lucaniden*-Fauna von Sumatra. Deutsche e. Z. 1889, pp. 232-240. [*Coleoptera*.]
6. —. *Lucanus gracilis* eine neue Art von Sikkim. T. c. p. 319. [*Coleoptera*.]
7. ALLARD, E. Contributions à la faune Indo-Chinoise. 5^e Memoire. *Galérucides* et *Alticides*. Ann. Soc. Ent. Fr. (6) ix, pp. 303-312. [*Coleoptera*.]
8. —. Diagnoses de *Coléoptères* nouveaux. Le Nat. 1889, pp. 33 & 43.
9. —. Note sur les *Galérucides*. *Coléoptères* Phytophages. C.R. ent. Belg. xxxiii, pp. lxvi-lxxxiii.

* An asterisk prefixed to a quotation indicates that the Recorder has not seen the Journal or Work referred to.

10. [ALLARD, E.] Nouvelle note sur les *Phytophages*. *T. c.* pp. cii-cxvii. [*Coleoptera*.]
ALPHÉRAKY. [See ROMANOFF (748).]
11. ANDRÉ, ED. *Species des Hyménoptères d'Europe et d'Algérie*. 33^e Fasc., iii, pp. 249-320.
12. ANDRÉ, E. *Hyménoptères nouveaux appartenant au groupe des Formicides*. *Rev. d'Ent.* viii, pp. 217-231.
13. ASHMEAD, W. H. Descriptions of new *Braconidae* in the collection of the U.S. National Museum. *P. U. S. Nat. Mus.* xi, pp. 611-671. [*Hyménoptera*.]
14. —. A generic synopsis of the *Bythoscopidae*. *Ent. Am.* v, pp. 125 & 126. [*Rhynchota*.]
2 new genera, without any indication of their species.
15. —. A generic synopsis of the *Aphididae*. *T. c.* pp. 187-189.
16. ATKINSON, E. T. New or little-known Indian *Rhynchota*. *J. A. S. B.* lvii, pp. 333-345.
17. —. A new genus and species of *Coccidae*. *Op. cit.* lviii, pp. 1-3, pl. i.
18. —. Notes on Indian *Rhynchota*; *Heteroptera*, No. 5. *T. c.* pp. 20-109.
19. —. Notes on Indian Insect pests. *Rhynchota*. *Ind. Mus. Notes*, i, pp. 1-8.
20. AURIVILLIUS, O. *Nordens fjärilar. Häftet i-vi*. Stockholm : 1888, 1889. [*Lepidoptera*.]
A manual of the *Macrolepidoptera* of Scandinavia, Finland, and Denmark. The plates, however, are taken from Berge's *Schmetterlingsbuch*, and include, consequently, many species not found in the above-named countries.
21. —. En ny art af släktet *Charaxes*. *Ent. Tidskr.* x, p. 191. [*Lepidoptera*.]
22. AUSTAUT, J. L. *Les Parnassiens de la faune paléarctique*. Leipzig : 1889, 222 pp., 32 pla. [*Lepidoptera*.]
Intended to diffuse a popular knowledge of the specific characters, variation, and distribution. Noticed in *B. E. Z.* xxxiii, pp. 406 & 407.
23. BAKER, G. T. On the distribution of the *Charlonia* group of the genus *Anthocharis*. *Tr. E. Soc.* 1889, pp. 523-533. [*Lepidoptera*.]
24. BALLION, E. Kurze Notizen ueber einige russische *Blaps*-Arten. iii Artikel. *Bull. Mosc. n.s.* ii, pp. 694-704. [*Coleoptera*.]
25. BALY, J. S. Contributions à la faune Indo-Chinoise. 6^e Mémoire. *Ann. Soc. Ent. Fr.* (6) ix, pp. 485-492. [*Coleoptera*.]
26. —. Descriptions of new South American *Coleoptera* of the genus *Diabrotica*. *P. Z. S.* 1889, pp. 88-95.
27. —. Diagnoses of uncharacterized species of *Diabrotica*. *Ent. M. M.* xxv, pp. 251-254. [*Coleoptera*.]

28. [BALY, J. S.] Notes on *Aulacophora* and allied genera. Tr. E. Soc. 1889, pp. 297-309. [*Coleoptera*.]
29. BANKES, E. R. First supplement to the *Lepidoptera* of the Isle of Purbeck. P. Dorset Field Club, x, pp. 197-213, pl.
30. BARRETT, C. G. Linen injured by *Agrotis* larvæ. Ent. M. M. xxv, pp. 220-222. [*Lepidoptera*.]
31. —. Notes on some very old specimens of *Lepidoptera*. T. c. pp. 223-225.
32. BASSETT, H. F. A short chapter in the history of the *Cynipidous* Gall-flies. Psyche, v, pp. 235-238. [*Hymenoptera*.]
33. BATES, H. W. On new Species of the Coleopterous Family *Carabida*, collected by Mr. J. H. Leech in Kashmir and Baltistan. P. Z. S. 1889, pp. 210-215.
34. —. On new Species of the Coleopterous Families *Cicindelidæ* and *Carabidæ* taken by Mr. Pratt in Chang Yang, near Ichang, on the Yang-tze, China. T. c. pp. 216-219.
35. —. On new Genera and Species of *Coleopterous* Insects from Mount Kini-Balu, North Borneo. T. c. pp. 383-393.
36. —. Contributions à la faune Indo-Chinoise. 3^e Mémoire. *Carabidæ*. Ann. Soc. Ent. Fr. (6) ix, pp. 261-286. [*Coleoptera*.]
37. —. Three new Species of *Coleoptera* from Japan. Ent. M. M. xxv, pp. 297 & 298.
38. —. New species of African *Coleoptera* (*Carabidæ*) in the Leyden Museum. Notes Leyd. Mus. xi, pp. 201-208.
— [See also GODMAN & SALVIN (324).]
39. BAUDI, F. Note entomologiche. Nat. Sicil. viii, pp. 197-200. [*Coleoptera*.]
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Includes some critical remarks on Grassi's, Cholodkovsky's, and Haase's views. Summary in J. R. Micr. Soc. 1889, p. 743.

329. —. Vergleichende Studien über die Keimhüllen und die Rückenbildung der Insecten. Denk. Ak. Wien, lv, pp. 109-162, pls. i-viii.

A contribution to the embryology of most of the orders, and an embryological arrangement of the *Insecta*, with nomenclature for the different forms.

330. GRAESER, L. Beiträge zur Kenntniss der *Lepidopteren*-Fauna des Amurlandes. III. B. E. Z. xxxiii, pp. 251-268.

331. GRASSI, B. Ein weiterer Beitrag zur Kenntniss des *Termiten*reiches. Ent. Nachr. xv, pp. 213-219. [*Neuroptera*.]

Apparently the same paper as that in Zool. Anz., though no reference thereto is given [cf. Ent. Nachr. xv, p. 229]. Translated in Psyche, v, pp. 250-254.

332. [GRASSI, B.] Ein weiterer Beitrag zur Kenntniss des *Termiten*-reiches. Zool. Anz. xii, pp. 355-361. [*Neuroptera*.]

Summary in J. R. Micr. Soc. 1889, p. 635.

333. —. Les ancêtres des Myriopodes et des Insectes. Arch. Ital. Biol. xi, pp. 1, 291, & 389, etc., 5 pls.

A translation of the memoir of 1888 [Zool. Rec. xxv, *Ins.* Titles, 329].

334. —, & ROVELLI, G. Tavola analitica dei *Tisanuri* italiani da noi finora riscontrati. Bull. Ent. Ital. xxi, pp. 3-8. [*Neuroptera*.]

335. GREEN, E. E. Descriptions of two new species of *Lecanium* from Ceylon. Ent. M. M. xxv, pp. 248-251. [*Rhynchota*.]

336. GROTE, A. R. A chapter on the literature of butterflies and moths. Rep. E. Soc. Ont. xix, pp. 51-63.

337. —. The Lepidopterous faunæ of Europe and N. America. Canad. Ent. xxi, pp. 21-24.

Lepidoptera are more variable in N. America than in Europe.

338. —. The classification of our butterflies. T. c. pp. 205-209. [*Lepidoptera*.]

339. —. The *Noctuidæ* of North America and Europe. T. c. pp. 121-126, 154-157, 188-193, 226-230. [*Lepidoptera*.]

340. GROUVELLE, A. *Cucujides* nouveaux ou peu connus. Ann. Soc. Ent. Fr. (6) ix, pp. 101-108, pl. v. [*Coleoptera*.]

341. —. Voyage de M. E. Simon au Venezuela. Coléoptères 2^e mémoire. *Cucujidæ*, *Rhysodidæ*, *Dryopidæ*, *Cyathoceridæ*, *Heteroceridæ*. T. c. pp. 157-166, pl. vi.

342. —. Espèce nouvelle de *Cucujide*. Bull. Soc. Ent. Fr. (6) ix, p. xxxiii. [*Coleoptera*.]

343. —. Diagnose d'un *Riolus* nouveau. T. c. p. lxxx. [*Coleoptera*.]

344. GUILLEBEAU, F. Révision du sous-genre *Lampra*, Esch. Rev. d'Ent. viii, pp. 1-12. [*Coleoptera*.]

On the synonymy of this paper, cf. GOZIS, t. c. pp. 89-91, and GUILLEBEAU, t. c. pp. 209-211.

345. HAASE, E. Über Mimicry bei *Schmetterlingen*. Tag. Deut. Nat. Vers. (6) i, p. 49. [*Lepidoptera*.]

346. —. Über den Einfluss des Hungers auf die Entwicklung der Thiere, mit Berücksichtigung der Reblausfrage. SB. Ges. Isis, 1888, pp. 3 & 4.

347. —. Die Abdominalanhänge der *Insekten*, mit Berücksichtigung der *Myriopoden*. Morph. JB. xv, pp. 331-435, pls. xiv & xv.

Chiefly devoted to *Thysanura*, the structures are described and figured, and the paper concludes with 39 general statements on homologies and phylogeny. Summary in J. R. Micr. Soc. 1890, pp. 26-28.

348. —. Ueber Abdominalanhänge bei Hexapoden. SB. nat. Fr. 1889, pp. 19-29.

349. [HAASE, E.] Ueber die Zusammensetzung des Körpers der Schaben (*Blattidæ*). *T. c.* pp. 128-136. [*Orthoptera*.]

Summary in *J. R. Micr. Soc.* 1890, p. 318.

350. —. Zur Anatomie der *Blattiden*. *Zool. Anz.* xii, pp. 169-172. [*Orthoptera*.]

351. HABERFELNER, J. Ueber entomologische Zuchthäuser. *Deutsche z. Z.* 1889, pp. 389-394. [*Coleoptera*.]

Describes a method for obtaining rare xylophagous *Coleoptera* in numbers.

352. HAGEN, H. A. Spaltung eines Flügels um das doppelte Adernetz zu zeigen. *Zool. Anz.* xii, pp. 377 & 378, pl.

353. —. Synopsis of the *Odonata* of N. America. No. 1. *Psyche*, v, pp. 241-250. [*Neuroptera*]

354. —. The Female of *Eutermes rippertii*. *T. c.* pp. 203-208. [*Neuroptera*.]

This consists of anatomical details, and is taken from "a proposed monograph of the anatomy of the *Termitina*."

355. —. Ueber die fruheren Zustände des *Libellen*, nebst Andeutung über Bildung des Thorax. *S. E. Z.* l, pp. 162-167.

He considers that each segment of the thorax consists really of three segments, one leg-bearing, one wing-bearing, one stigma-bearing.

356. —. Dr. Christian Zimmermann. *Canad. Ent.* xxi, pp. 53-57 & 71-73.

Includes some notes of Z.'s hitherto unpublished.

357. HALJ, B. Öfersigt af Skandinaviens *Orthopterer* jemte beskri-
ningar. *Bih. Sv. Ak. Handl.* xiv, Afd. 4, No. 2, 41 pp., 2 pls.

358. HAMILTON, J. Electric light captures. *Psycho*, v, pp. 149 & 150 [*Coleoptera*.]

359. —. Catalogue of the *Coleoptera* common to North America, Northern Asia, and Europe, with the distribution and bibliography. *Tr. Am. Ent. Soc.* xvi, pp. 88-162.

Translated, with remarks and additions, by Fauvel in *Rev. d'Ent.* viii, pp. 92-174.

360. HAMPSON, G. F. The Butterflies of the Nilgiri district, South India. *J. A. S. B.* lvii, pp. 346-368. [*Lepidoptera*.]

275 species are mentioned, and it is thought not more than 20 remain to be added.

361. HANDLIRSCH, A. Monographie der mit *Nysson* und *Bembex* verwandte Grab-wespen. *SB. Ak. Wien*, cxvii, Abth. i, pp. 316-565, pls. i-iii. [*Hymenoptera*.]

This part is entirely devoted to the genus *Gorytes*.

362. —. Beitrag zur Kenntniss des Gespinnstes von *Hilara sartrix*, Becker. *Verh. z.-b. Wien*, xxxix, pp. 623-626. [*Diptera*.]

— See also KOHL & HANDLIRSCH (463).

363. HARPER, W. The Beetles of British Guiana. Timehri, n.s ii, pp. 62-84. [*Coleoptera*.]

Elementary remarks, but including one or two on habits.

364. HARRINGTON, W. H. New Species of Canadian *Tenthredinidae*. Canad. Ent. xxi, pp. 95-99. [*Hymenoptera*.]

365. HART, W. E. Notes on a Caterpillar Farm. J. Bomb. N. H. Soc. iv, pp. 277-289. [*Lepidoptera*.]

366. HARTERT, E. Biologisches aus dem indischen Faunengebiete. B. E. Z. xxxiii, pp. 289-292.

Some remarks on known instances of seasonal forms and mimicry.

367. HAURY, C. *Carabus akensis*, n. sp. Le Nat. 1889, p. 106 [*Coleoptera*.]

368. HELLER, K.M. Bemerkung über die Lebensweise von *Propomacrus bimacronatus*, Pall. Ent. Nachr. xv, pp. 96-99. [*Coleoptera*.]

369. HENKING, H. Untersuchungen über die ersten Entwicklungsvorgänge in den Eiern der Insekten. 1. Das Ei von *Pieris brassicae*, L., nebst Bemerkungen über Samen und Samenbildung. Z. wiss. Zool. xlix, pp. 503-564, pls. xxiv-xxvi.

1. Ueber das Keimbläschen der Ovarialeier. 2. Die ersten Kernveränderungen im abgelegten Ei. 3. Veränderungen des Eikernes bis zur Abstossung des ersten Richtungskörpers und des Thelyid. 4. Bildung des zweiten Richtungskörpers. 5. Ueber reifende Spermatozoen im Hoden. 6. Spermatozoen im Ei. 7. Veränderungen des einen ausgezeichneten Spermatozoon bis zu seiner copulation mit dem Eikern. 8. Verschmelzung der Geschlechtskerne und Theilung der ersten Embryonal Kerne. 9. Beschaffenheit und Bewegungen des Eiplasmas. 10. Stellung der ersten Furchungsspindel. 11. Weitere Ausgestaltung der Richtungskörper. 12. Das Schicksal überzähliger Samenfasern im Ei. 13. Ueber die Zeitverhältnisse bei den geschilderten Entwicklungsvorgängen. 14. Besonderheiten der Befruchtung und darauf bezügliche Nomenklatur. 15. Kritische Bemerkungen.

370. —. Ueber die Bildung von Richtungskörpern in den Eiern der Insekten und deren Schicksal. Nachr. Ges. Gotting, 1888, pp. 414-419.

Observations on the eggs of a number of species of various orders.

371. —. Ueber die Befruchtung der Eier von *Agelastica alni*, L. *Op. cit.* 1889, pp. 544-546.

372. HENSHAW, S. Second supplement to the list of *Coleoptera* of America, north of Mexico. Ent. Am. v, pp. 127-138.

373. HERING, E. Beiträge zur Mitteleuropäischen *Micro-Lepidopteren*-fauna. S. E. Z. 1, pp. 290-320.

374. HEYDEN, L. v. Ueber Copula verschiedenartiger *Coleopteren*. Deutsche e. Z. 1889, p. 212.

Six cases, some between species of different genera.

375. [HEYDEN, L. v.] Stand der Rebblausfrage auf der linken Rheinseite der Rheinprovinz. *T. c.* pp. 209–211.
376. —. *Descriptiones Coleopterorum novorum Regionis Palæarcticæ.* *T. c.* pp. 325–330.
377. —. Ueber Nigrino-Varietäten von *Curabiceina* vom Pic de Nère in den Hautes Pyrénées. *T. c.* pp. 331 & 332. [*Coleoptera.*]
378. —. Weitere Mittheilung über Nigrino-Varietäten vom Pic de Nère in den Hautes Pyrénées. *T. c.* p. 366. [*Coleoptera.*]
379. —. Beitrag zur Insectenfauna der östlichen Kirghisen-Steppe, mitgetheilt von von HEYDEN unter Mitwirkung der Herren BRAUER, BRUNNER-VON-WATTENWYL, KOHL, KONOW, MAYR, MIK, SCHMIEDKNECHT und de SELYS-LONGCHAMPS. *Hor. Ent. Ross.* xxiii, pp. 88–111.
- Some descriptions of new *Diptera* by MIK, are included in this.
380. —. *Insecta* Cl. G. N. Potanin in China et in Mongolia novissime lecta. XII. *Scarabæidæ, Cantharidæ, Cleridæ, Lagriidæ, Melandryidæ, Pedilidæ, Anthicidæ.* Unter Mitwirkung der Herren J. BOURGEOIS, FAIRMAIRE, und Dr. KRAATZ. *T. c.* pp. 654–677. [*Coleoptera.*]
381. HEYDEN, L. v., & KRAATZ, G. Zwitter und Monstrositäten aus den Sammlungen von. *Deutsche o. Z.* 1889, pp. 221 & 222, pl. i.
382. HEYLAERTS, F. J. M. Opmerkingen betreffende Nederlandsche *Micro-Lepidoptera.* *Tijdschr. Ent.* xxxii, pp. 423 & 424.
383. —. Une espèce nouvelle du genre *Suana*, Walk. *C.R. ent. Belg.* xxxiii, p. xxv. [*Lepidoptera.*]
384. —. *Nyctemera ludekingi*, v. Voll. in litt. *T. c.* p. xxvi. [*Lepidoptera.*]
385. —. Une *Psychide* nouvelle de l'Asie centrale. *T. c.* p. lvi. [*Lepidoptera.*]
386. HOFFER, E. Die Schmarotzerhummeln Steiermarks. *MT. Ver. Steierm.* xxv, pp. 82–158, pl. [*Hymenoptera.*]
- Summary in *J. R. Micr. Soc.* 1890, p. 31.
387. —. Beiträge zur *Hymenopterenkunde* Steiermarks. *Op. cit.* xxiv, pp. 65–100.
- Includes remarks on habits and variation, especially in the genus *Bombus*.
388. HOFMANN, —. *Butalis bifissella*, n. sp., und *Lypusa ? fulvipennis*, m. *S. E. Z.* 1, pp. 107–110. [*Lepidoptera.*]
389. —. Zeller's Sammlung in London. *T. c.* pp. 286–290.
390. HOLLAND, W. J. Contributions to a knowledge of the *Lepidoptera* of West Africa. Paper II. List of African *Sphingidæ* received during the years 1887 and 1888. *Tr. Am. Ent. Soc.* xvi, pp. 55–70.
391. —. Description of new species of Japanese *Heterocera.* *T. c.* pp. 71–76. [*Lepidoptera.*]

[HOLLAND, W. J.] [See also HOWARD (466).]

392. HOLMGREN, A. E. *Ichneumonologia Suecica. Tomus tertius, Ichneumonides pneustici.* Stockholm: 1889, pp. 343-466. [*Hymenoptera.*]

Contains descriptions of the Swedish species, and of some from other parts of Europe, as well as of new genera. There are two title pages, bearing dates 1889 & 1890, but I believe the work was issued in 1889. A prefatory note by Aurivillius bears the date December, 1889.

393. HONRATH, E. G. Wenig bekannte Tagfalter. III. B. E. Z. xxiii, p. 167. [*Lepidoptera.*]

394. —. Neue *Rhopalocera*. VIII. T. c. pp. 161-166, pl. ii.

395. —. Neue *Rhopalocera*. IX. T. c. p. 403. [*Lepidoptera.*]

396. HORN, G. H. A synopsis of the *Halticini* of Boreal America. Tr. Am. Ent. Soc. xvi, pp. 163-320, pls. v-vii. [*Coleoptera.*]

397. —. Synonymical Notes. Ent. Am. v, pp. 198 & 199.

A synonymy of the N. American *Coleoptera* described in Germar's *Insectorum species novæ.*

398. HORVATH, G. Essai monographique sur le genre *Trigonosoma*. Rev. d'Ent. viii, pp. 33-49. [*Rhynchota.*]

399. —. Notes synonymiques et géographiques sur les *Hémiptères* Paléarctiques. T. c. pp. 325-331.

400. —. Beitrag zur Hemipteren-Fauna von Turkmenien. Wien. ent. Z. viii, p. 169-174.

401. —. Analecta ad cognitionem *Heteropterorum* Himalayensium. Term. füzetek, xii, pp. 29-40. [*Rhynchota.*]

402. HOWARD, L. O. A commencement of a study of the parasites of cosmopolitan insects. P. E. Soc. Washington, i, pp. 118-136.

403. —. A parasite of the supposed eggs of the cotton stainer. Ins. Life, i, pp. 241 & 242. [*Hymenoptera.*]

404. —. Three new parasites of *Icerya*. T. c. pp. 268-270. [*Hymenoptera.*]

405. —. A newly-imported elm-insect. Op. cit. ii, pp. 34-41. [*Coccidæ.*]

406. —. Scientific results of explorations by the U. S. Fish Commission steamer 'Albatross.' No. v. Annotated catalogue of the Insects collected in 1887-88. P. U. S. Nat. Mus. xii (No. 771), pp. 185-216.

The reports are made by several entomologists, and 1 new *Lepidopteron* is described by HOLLAND from the Galapagos Archipelago.

407. —. The *Hymenopterous* parasites of North American Butterflies, including a section upon the *Microgasters*, by C. V. RILEY. Scudder Butt. New England, iii, pp. 1869-1911, pls. lxxxviii & lxxxix.

— [See also RILEY & HOWARD (719, 720, 721).]

408. HUDSON, G. V. On the Natural History of three Species of *Micro-Lepidoptera*. Tr. N. Z. Inst. xxi, p. 189, pl. viii.
409. —. On the varieties of a common Moth (*Declana floccosa*). T. c. pp. 190–193, pl. ix. [*Lepidoptera*.]
410. —. Description of a new species of *Arctiidae* from New Zealand. Ent. xxii, p. 53.
411. HULST, G. D. The *Epipaschiinae* of North America. Ent. Am. v, pp. 41–52 & 61–76, pl. [*Lepidoptera*.]
412. JACKSON, W. H. Studies in the Morphology of the *Lepidoptera*. I. Zool. Anz. xii, pp. 622–626.

Relates to external indications of sex in the chrysalis, and to the development of part of the oviduct. Summary in J. R. Micr. Soc. 1890, p. 29.

413. JACOBI, A. Ueber die Entwicklung der Zeichnung an der Schmetterlingsflügeln. Protok. obsch. estest. Kazan, 1888–1889, No. 110, pp. 1–13.

The memoir is in Russian, but is followed by a *résumé* in German.

414. JACOBY, M. List of the *Crioceridae*, *Cryptocephalidae*, *Chrysomelidae*, and *Galerucidae*, collected in Venezuela by M. Simon, with descriptions of the new Species. P. Z. S. 1889, pp. 263–292. [*Coleoptera*.]
415. —. Descriptions of some new species of Phytophagous *Coleoptera*. Ent. M. M. xxv, pp. 203–206.

— [See also GODMAN & SALVIN (324).]

416. JAKOWLEW, B. *Insecta* a Cl. G. N. Potanin in China et in Mongolia novissime lecta. III. Genus *Sphenoptera*, Sol. Hor. Ent. Ross. xxiii, pp. 83–87. [*Coleoptera*.]

417. JAKOWLEW, V. E. *Hemiptera Heteroptera* Irkutensia nova. T. c. pp. 50–71.

The descriptions are in Russian, but there are Latin diagnoses.

418. —. *Hemiptera Heteroptera* sibirica. T. c. pp. 72–82.
419. JANSON, O. E. Description of a new Goliath Beetle from Central Africa. Ent. xxii, p. 40. [*Coleoptera*.]
420. —. Descriptions of two new species of the *Coleopterous* family *Cetoniidae*. T. c. pp. 100 & 101.
421. —. Descriptions of two new species of Australian *Cetoniidae*. P. Linn. Soc. N.S.W. (2) iv, pp. 127–130. [*Coleoptera*.]
- [See also ORMEROD (614).]

422. °JOURDAN, E. Les sens chez les animaux inférieurs. Paris : 1889.

PLATEAU gives an account of this work, C.R. ent. Belg. xxxiii, pp. clix–clxi.

423. JUDEICH, J. F., & NITSCHKE, H. Lehrbuch der Mitteleuropäischen Forstinsektenkunde, als achte Auflage von Dr. J. T. C. Ratzeburg. Die Waldverderber und ihre Feinde. II Abtheilung, specieller Thiel. I Hälfte: Geradflügler, Netzflügler und Käfer, pp. 265–623, pls. iv–vi.
424. JULLIEN, J. La chique (*Sarcopsylla penetrans*, Westw.) sur la côte occidentale d'Afrique. Bull. Soc. Z. Fr. xiv, pp. 93–95. [*Diptera*.]
425. KAMMICH, F. Beitrag zur Kenntniss der *Ascalaphiden* Madagaskars. B. E. Z. xxxiii, pp. 269–272. [*Neuroptera*.]
426. —. Ueber eine neue, der *Idionyx luctifera*, Selys, verwandte ostafrikanische *Libelluliden*-Gattung. T. c. pp. 280–284. [*Neuroptera*.]
427. —. Beiträge zur Kenntniss der Arten und Gattungen der *Libellulinen*. T. c. pp. 347–392. [*Neuroptera*.]
- Includes many new genera, and remarks on classification supplementary to Kirby's work.
428. —. Orthopterologische Mittheilungen. I. Ueber die *Chorotypiden*, Ent. Nachr. xv, pp. 7–10. II. Ueber die *Mastaciden*, t. c. pp. 24–36. III. Ueber von Herrn Oskar Schönmann in Chile gesammelte *Phaneropteriden*, t. c. pp. 124–127.
429. —. Oekonomisch entomologische Notizen. T. c. pp. 57–59 & 382–384.
430. —. *Sapho venusta* eine neue afrikanische *Libelle* aus der Familie der *Kalopterygiden*. T. c. pp. 233 & 234. [*Neuroptera*.]
431. —. *Libellula herculea*, eine neue südamerikanische Art mit inneren Dreieck der Hinterflügel. T. c. p. 235. [*Neuroptera*.]
432. —. Neue *Äschniden* der indo-australische Region. T. c. pp. 236–239. [*Neuroptera*.]
433. —. *Hematopota strigipennis* eine neue *Diptere* von Gabun. T. c. p. 239.
434. —. Beitrag zur Kenntniss der *Libellulinen* mit vierseitiger cellula cardinalis (*Nannophya*, Ramb.). T. c. pp. 245–263. [*Neuroptera*.]
435. —. Ueber die *Mantiden*-gattung *Danuria*, Stål. T. c. pp. 270–275. [*Orthoptera*.]
436. —. Beschreibung einer neuen *Libelluline* Madagaskars. T. c. p. 276. [*Neuroptera*.]
437. —. Eine neue *Libelluline* der Gattung *Tetrathemis*. T. c. pp. 321–323. [*Neuroptera*.]
438. KESSLER, H. F. Beobachtungen über *Galruca viburni*, Payk. Ber. Ver. Kassel, xxxv, pp. 54–63. [*Coleoptera*.]
439. —. Die Ungefährlichkeit und kostengünstige Vertilgung der Blutlaus *Schizoneura lanigera*. T. c. pp. 64–66. [*Hemiptera*.]

440. KHEIL, N. M. Ein neuer *Danaid*. B. E. Z. xxxiii, p. 393. [*Lepidoptera*.]
441. KIEFFER, J. J. Zwei neue Gallmücken. Wien. ent. Z. viii, pp. 262-264. [*Diptera*.]
442. —. Neue Beiträge zur Kenntniss der Gallmücken. Ent. Nachr. xv, pp. 149-156, 171-176, 183, 184, & 208-212. [*Diptera*.]
443. KING, J. J. F. X. A contribution towards a *Neuropterous* fauna of Ireland. P. N. H. Soc. Glasg. (n.s) ii, pp. 259-292.
444. KIRBY, W. F. A revision of the subfamily *Libellulinae*, with descriptions of new Genera and Species. Tr. Z. Soc. xii, pp. 249-348, pls. li-lvii. [*Neuroptera*.]
- 88 genera are admitted, 40 of them being new, and upwards of 50 new species are described. Alar-neuration is chiefly relied on for classification, and three of the plates are devoted to it. The only indication of the species included in each genus is a mention of the type species and some incidental remarks. Reviewed by KARSCH in Ent. Nachr. xv, pp. 342 & 343.
445. —. Descriptions of new Genera and Species of *Odonata* in the collection of the British Museum, chiefly from Africa. P. Z. S. 1889, pp. 297-303. [*Neuroptera*.]
446. —. On some new or little-known species of *Libellulinae* from Jamaica in the Dublin Museum of Science and Art. Ann. N. H. (6) iv, pp. 231-233. [*Neuroptera*.]
447. —. On the collection of *Lepidoptera* formed by Basil Thomson, Esq., in the Louisiade Archipelago. T. c. pp. 156-167.
448. —. Description of a new Butterfly from Trinidad. Ent. xxii, p. 149. [*Lepidoptera*.]
449. —. Descriptions of new Species of African *Nymphalidae*. Ann. N. H. (6) iii, pp. 246-249. [*Lepidoptera*.]
450. —. Notes on the species of *Phasmide* collected by Basil Thomson, Esq., in the Louisiade Archipelago. Op. cit. iv, pp. 229-231. [*Orthoptera*.]
451. —. Descriptions of new Species of *Phasmide* from Dominica, Santa Lucia, and Brazil, in the collection of the British Museum. Op. cit. iii, pp. 501-504. [*Orthoptera*.]
452. —. Descriptions of new species of *Scoliidae*, in the collection of the British Museum, with occasional reference to species already known. Tr. E. Soc. 1889, pp. 443-454, pl. xv. [*Hymenoptera*.]
453. —. Descriptions of new species of *Tenthredinidae*, *Cynipidae*, and *Chalcididae*, in the collection of the British Museum. Ann. N. H. (6) iv, pp. 141-144. [*Hymenoptera*.]
- [See also AITCHISON (1), and SMITH & KIRBY (827).]
454. KIRK, T. The Mole-cricket (*Gryllotalpa vulgaris*) in New Zealand. Tr. N. Z. Inst. xxi, pp. 233-235. [*Orthoptera*.]

488. [LEECH, J. H.] *New Species of Crambi from Japan and Corea.* *T. c.* pp. 106-108. [*Lepidoptera.*]
489. LEEGE, O. *Die Macrolepidopteren der Insel Juist.* *Abh. Ver. Brem.* x, pp. 556-565.
490. LÉFÈVRE, E. *Contributions à la faune Indo-Chinoise. 4^e Mémoire. Cryptocéphalides, Clytrides, Eumolpides.* *Ann. Soc. Ent. Fr.* (6) ix, pp. 287-302. [*Coleoptera.*]
491. —. *Voyage de M. Ch. Alluaud dans le territoire d'Assinie (Afrique occidentale) en juillet et août 1886. 5^e Mémoire. Eumolpides.* *T. c.* pp. 300-302. [*Coleoptera.*]
492. —. *Voyage de M. E. Simon au Venezuela. 6^e Mémoire. Clytrides, Lamprosomides, et Eumolpides.* *T. c.* pp. 329-336. [*Coleoptera.*]
493. —. *Descriptions d'un genre nouveau et de plusieurs nouvelles espèces de Coléoptères Phytophages de la famille des Eumolpides.* *T. c.* pp. 337-340.
494. —. *Diagnoses de trois nouvelles espèces d'Eumolpides.* *Bull. Soc. Ent. Fr.* (6) ix, p. xx. [*Coleoptera.*]
495. —. *Nouvelle espèce de Clytrides.* *T. c.* p. lxx. [*Coleoptera.*]
496. —. *Nouvelle espèce de Clytrides.* *T. c.* p. cxix. [*Coleoptera.*]
497. —. *Nouvelle espèce de Coléoptère de la famille des Eumolpides.* *T. c.* p. clix. [*Coleoptera.*]
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646. POUJADE, G. A. Description d'un *Bombycide* nouveau de Madagascar. *Bull. Soc. Ent. Fr.* (6) ix, p. lxiii. [*Lepidoptera*.]

647. POULTON, E. B. Mr. A. G. Butler's remarks upon distasteful Insects. *Ann. N. H.* (6) iv, pp. 358-360.

Refers to BUTLER's paper (119).

648. PROVANCHER, L. Petite faune entomologique du Canada. Cinquième ordre. Les *Hémiptères*, pp. 205-292.

649. —. Additions à la faune *Hyménoptérologique* de la province de Québec. Pp. 441-475.

These pages consist of a catalogue in which there is much synonymy. Apparently the volume is now completed.

PUTON. [See NOUALHIER (606).]

650. QUEDENFELDT, G. Zwei neue afrikanische *Tenebrioniden*. *Ent. Nachr.* xv, pp. 353-356. [*Coleoptera*.]

651. —. Drei neue *Tenebrioniden* aus Tripolitani. *B. E. Z.* xxxiii, pp. 395-400. [*Coleoptera*.]

652. —. Ein neuer dem Weinbau schädlicher Käfer in Tunesien. *T. c.* pp. 401 & 402. [*Coleoptera*.]

653. QUEDENFELDT, M. Tripolitanische *Staphylinen* aufgezählt von, nebst zwei Neubeschreibungen von E. Eppelsheim. *T. c.* pp. 311-316. [*Coleoptera*.]
654. RADOSZKOWSKI, O. Notice sur le genre *Bombus*. Bull. Mosc. 1889, pp. 202-209. [*Hymenoptera*.]
655. —. Révision des armures copulatrices des mâles de la tribu des *Chrysides*. Hor. Ent. Ross. xxiii, pp. 3-40, pls. i-vi. [*Hymenoptera*.]
656. RAGONOT, E. L. Espèces nouvelles de *Microlépidoptères*. Bull. Soc. Ent. Fr. (6) ix, pp. cv-cvii.
657. —. Deux nouvelles espèces de *Microlépidoptères* trouvés en Espagne. *T. c.* p. cxxx.
658. —. Diagnoses de huit espèces inédites de *Phycites*. *T. c.* pp. ccxviii-ccxx. [*Lepidoptera*.]
659. —. *Phycitidæ* and *Galleriidæ* of North America. Some new species and a general Catalogue. Ent. Am. v, pp. 113-117. [*Lepidoptera*.]
Cf. notes thereon by HULST, *t. c.* p. 155 & 156.
660. RAGUSA, E. Note Lepidotterologische. Nat. Sicil. viii, pp. 221-229, 257, & 258, pl. iii, and ix, pp. 3-8.
661. RASPAIL, X. Note rectificative sur l'histoire de la Chique (*Sarcophylla penetrans*). Bull. Soc. Z. Fr. xiv, pp. 366-369.
662. RÁTHAY, E. Das Auftreten der Gallenlaus im Versuchs-weingarten zu Klosterneuburg im Jahre 1837. Verh. z.-b. Wien, xxxix, pp. 47-88, pls. ii & iii.
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663. —. Ueber extraflorale Nectarien. SB. Verh. z.-b. Wien, xxxix, pp. 14-21.
 Discusses the visits of insects to extrafloral nectaries.
664. REBEL, H. Beiträge zur *Microlepidopteren*-Fauna Oesterreich-Ungarns. Verh. z.-b. Wien, xxxix, pp. 293-326, pl. viii.
 This enumeration of additions to a local fauna is accompanied by many critical and synonymical observations.
665. REDTENBACHER, J. Beitrag zur *Orthopteren*-Fauna von Turkmenien. Wien. ent. Z. viii, pp. 23-32.
 —. [See also BRAUER, REDTENBACHER, & GANGLBAUER (98).]
666. RÉGIMBART, M. Contributions à la faune Indo-Chinoise. 2^e Mémoire. *Hydrocanthares*. Ann. Soc. Ent. Fr. (6) ix, pp. 147-156. [*Coleoptera*.]
667. —. Voyage de M. Ch. Alluaud dans le territoire d'Assinie (Afrique occidentale). 2^e Mémoire. *Dytiscidæ* et *Gyrinidæ*. *T. c.* pp. 247-250. [*Coleoptera*.]
668. —. *Dytiscidæ* et *Gyrinidæ* nouveaux ou rares de la collection du Musée Royal de Leyde. Notes Leyd. Mus. xi, pp. 51-63. [*Coleoptera*.]

669. [RÉGIMBART, M.] Description d'un Dytiscide nouveau. *T. c.* p. 112. [*Coleoptera.*]
670. REGNARD, P. Sur l'activité vitale des Chrysalides. *C.R. Soc. Biol.* (9) i, pp. 57-60.
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671. REISET, J. Memoire sur les dommages causés à l'Agriculture par le hanneton et sa larve; mesures prises pour la destruction de cet insecte; suites et résultats. *C.R.* cviii, pp. 835-841. [*Coleoptera.*]
672. REITTER, E. Neue *Coleopteren* aus Europa, den angrenzenden Ländern und Sibirien, mit Bemerkungen über bekannte Arten. *Deutsche e. Z.* 1889, Sechster Theil, pp. 17-44; Siebenter Theil, pp. 273-288; Achter Theil, pp. 369-376.
673. —. Uebersicht der Arten der *Coleopteren*-Gattung *Anisoplia* aus Europa und den angrenzenden Ländern. *T. c.* pp. 99-111.
674. —. Eine neue bayerische *Liodes*-Art. *T. c.* p. 111. [*Coleoptera.*]
675. —. Bestimmungstabelle der flachen, Kaukasischen *Carabus*- oder *Tribax*-Arten. *T. c.* pp. 241-250. [*Coleoptera.*]
676. —. Berichte über die von E. v. Oertzen im Jahre 1887 in Griechenland u. Klein-Asien gesammelten *Coleopteren*. ix. *T. c.* pp. 251-259.
677. —. Bemerkungen zu europäischen *Elater*-Arten. *T. c.* p. 260. [*Coleoptera.*]
678. —. Uebersicht der Palæarktischen *Chrysanthia*-Arten. *T. c.* p. 266. [*Coleoptera.*]
679. —. Uebersicht der bekannten *Scaptia*-Arten der palæarktischen Fauna. *T. c.* pp. 267 & 268. [*Coleoptera.*]
680. —. Bemerkungen und Berichtigungen zu den *Clavicornen* in der Fauna Baltica 2 Aufl. und Fauna Transsylvanica von Dr. G. Seidlitz. *T. c.* pp. 289-318. [*Coleoptera.*]
681. —. Neue *Coleopteren* aus dem Leydener Museum. *Notes Leyd. Mus.* xi, pp. 3-9.
682. —. Analytische Tabelle zur Bestimmung der europäischen *Throscus*-Arten. *Wien. ent. Z.* viii, pp. 35 & 36. [*Coleoptera.*]
683. —. *Coleopteren* aus Circassien gesammelt von Hans Leder im Jahre 1887. Theil x, xi. *T. c.* pp. 63-70, 93, & 94.
684. —. Neue *Coleopteren* aus Circassien gesammelt von A. Starck. *T. c.* pp. 97-104.
685. —. Zwei neue *Meloë*-Arten aus Syrien und Armenien. *T. c.* pp. 106 & 107. [*Coleoptera.*]
686. —. *Coleopterologische* Notizen. xxxi-xxxiii. *T. c.* pp. 125, 163, & 230.
687. —. Zwei neue *Trogositiden* aus Japan. *T. c.* p. 217. [*Coleoptera.*]

688. [REITTER, E.] Beschreibungen der bekannten *Tritomiden* Japans mit Berücksichtigung der neuen Sammelresultate des Herrn George Lewis in den Jahren 1880 & 1881. *T. c.* pp. 245–249. [*Coleoptera*.]
689. —. Uebersicht der mir bekannten *Coleopteren*-Gattungen der *Melolonthini* im Erichson'schen Sinne, aus der paläarktischen Fauna. *T. c.* pp. 275–279.
690. —. Uebersicht der mir bekannten Arten der *Coleopteren*-Gattung *Triodonta*, Muls. *T. c.* pp. 288–285.
691. —. Zwei neue *Coleopteren*-Gattungen aus Transkaukasien. *T. c.* pp. 289–292, pl. iv.
692. —. Eine neue, interessante *Rybaxis* aus Valdivia. *T. c.* p. 292. [*Coleoptera*.]
693. —. Die bekannten *Cryptophagiden* Japans, mit Beschreibungen neuer, in den Jahren 1880 und 1881, von George Lewis gesammelten Arten. *T. c.* pp. 299–304. [*Coleoptera*.]
694. —. Eine neue *Alexia* aus Algier. *T. c.* p. 304.
695. —. Verzeichniss der *Cucujiden* Japans mit Beschreibungen neuer Arten. *T. c.* pp. 313–320. [*Coleoptera*.]
696. —. Uebersicht der Arten der mit *Oxythyrea*, Muls., verwandten Gattungen aus Europa und den angrenzenden Ländern. *Ent. Nachr.* xv, pp. 37–40. [*Coleoptera*.]
697. —. Uebersicht der mir bekannten *Elaten*-Arten der paläarktischen Fauna. *T. c.* pp. 110–116. [*Coleoptera*.]
698. —. Uebersicht der bekannten Arten der *Coleopteren*-Gattung *Pæderus*, Gr. *T. c.* pp. 169–171. [*Coleoptera*.]
699. —. Uebersicht der mir bekannten *Adoretus*-Arten der paläarktischen Fauna. *T. c.* pp. 267–270. [*Coleoptera*.]
700. —. *Insecta* a Cl. G. N. Potanin in China et in Mongolia novissime lecta. VIII. *Clavicornia*, *Hydrophilidae*, *Bruchidae*. *Hor. Ent. Ross.* xxiii, pp. 555–559. [*Coleoptera*.]
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702. RETOWSKI, O. Verzeichniss der von mir auf meiner Reise von Konstantinopel nach Batum gesammelten *Orthopteren*. *Ber. Senck Ges.* 1889, pp. 217–223.
703. REUTER, O. M. En ny *Ceratocombus* från Finland. *Medd. Soc. Fenn.* xv, pp. 154–157. [*Rhynchota*.]
704. REY, C. Deux espèces nouvelles du genre *Cylindromorphus*. *Bull. Soc. Ent. Fr.* (6) ix, pp. clx & clxi. [*Coleoptera*.]
705. RIBBE, C. Zwei neue Tagschmetterlinge aus Afrika. *Deutsche o. Z. Lep.* 1889, pp. 181 & 182. [*Lepidoptera*.]

706. [RIBBE, C.] Einige neue Schmetterlinge von Banggaja. *T. c.* pp. 183-185. [*Lepidoptera*.]
A small island near Celebes.
707. RIBBE, H. Abweichungen und Zwitter aus der Sammlung des Herrn Gustav Bornemann in Magdeburg. *T. c.* pp. 185 & 186, pl. iv. [*Lepidoptera*.]
708. RICHARDSON, N. M. Description of a species of *Epischnia* (*banksiella*) new to science, from Portland. P. Dorset Field Club, x, pp. 192-196, pl.
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709. —. Substitution of a Wing for a Leg in *Zygena filipendula*, and notes on the yellow variety of that species. *Ent. M. M.* xxv, pp. 289 & 290. [*Lepidoptera*.]
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The more important parts of this report are, "The Plum Curculio," "The fluted scale," "The Hop-plant Louse."
714. —. Systematic relations of *Platypsyllus* as determined by the larva. *Ins. Life*, i, pp. 300-307. [*Coleoptera*.]
715. —. Additional note on the *Megilla* parasite. *T. c.* p. 338. [*Hymenoptera*.]
716. —. Two brilliant and interesting *Micro-Lepidoptera* new to our Fauna. P. E. Soc. Washington, i, pp. 155-159.
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718. —. Notes on *Pronuba* and *Yucca* Pollination. P. E. Soc. Washington, i, pp. 150-154.
— [See also HOWARD (407).]
719. RILEY & HOWARD. The Horn-fly (*Hæmatobia serrata*, Robineau-Desvoidy). *Ins. Life*, ii, pp. 93-103. [*Diptera*.]
720. —. The so-called Mediterranean Flour Moth. *T. c.* pp. 166-171. [*Lepidoptera*.]
721. —. The Red Bug or Cotton Stainer. *Op. cit.* pp. 234-241. [*Rhynchota*.]

722. RIE, F. Beiträge zur Kenntniss der schweizerischen *Trichopteren*. MT. schw. ent. Ges. viii, pp. 102-143. [*Neuroptera*]

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724. —. On a new species of the Longicorn Genus *Zonopterus*, Hope. T. c. p. 10. [*Coleoptera*.]
725. —. A new species of the Longicorn Genus *Pachytaria*, Serv. T. c. p. 49. [*Coleoptera*.]
726. —. Preliminary descriptions of new species of the *Coleopterous* Genus *Helota*, Macleay. T. c. pp. 99-111.
727. —. On the Longicorn Genus *Orion*, Guer. T. c. p. 144. [*Coleoptera*.]
728. —. The species of the Malacoderm Genus *Ichthyurus*, Westw. T. c. pp. 159 & 160. [*Coleoptera*.]
729. —. On an undescribed species of the *Coleopterous* Genus *Helota*, Macleay. T. c. p. 189.
730. —. The species of Lucanoid *Coleoptera* hitherto known as inhabiting the island of Sumatra. T. c. pp. 233-236.
731. —. A new Javaneese species of the Buprestid Genus *Aphanisticus*, Latr. T. c. p. 237. [*Coleoptera*.]
732. —. On some Sumatran *Coleoptera*, with description of a new Genus and Species of Longicorn. T. c. pp. 241-246.
733. RIVERS, J. J. A new genus and species of N. A. *Scarabæidæ*. Proc. Cal. Ac. Sci. (2) i, pp. 100-102. [*Coleoptera*.]
734. —. A new species of Californian *Lepidoptera*. T. c. p. 103.
735. —. A new *Pleocoma*. Ent. Am. v, p. 17. [*Coleoptera*.]

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737. ROELOFS, W. De japansche *Curculioniden*-fauna vergeleken met die van andere landen. Tijdschr. Ent. xxxii, pp. 20-28. [*Coleoptera*.]
738. RÖDER, V. v. Nachträge zur Gattung *Anisomera*, Mg., in der Fauna insectorum Helvetiæ *Diptera*, p. 56, von Herrn Professor Dr. G. Huguenin, pp. 1-4.

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740. —. *Anacanthaspis*, nov. gen. der *Cænomyidæ*. T. c. pp. 7-10. [*Diptera*.]

741. [RÖDER, V. v.] Eine neue Familie. T. c. p. 186. [*Diptera*.]
742. —. *Papilio* (*Epiphyas*) *peruiana* n. sp. Ent. Nachr. xv. pp. 54–56. [*Diptera*.]
743. ROGENDORF, A. F. Afrikanische Schmetterlinge des k. k. naturhistorischen Hofmuseums. Ann. Hofmuseums Wien. ix. pp. 547–554, pl. xxiii. [*Lepidoptera*.]
744. —. *Papilio kagei* eine neue Art aus Siam. Verh. z. b. Wien, xxxix, p. 1. [*Lepidoptera*.]
745. —. Uebersicht der *Lepidopteren* Fauna Tenerife's. SB. z. b. Wien, xxxix, pp. 35 & 36.
746. —. *Lepidopteren* aus Ceylon. T. c. pp. 60 & 61.
A new species established on a larva and its remarkable case.
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2. ALPHÉRAKY, S. *Lépidoptères* rapportés du Thibet par le Général N. M. Przewalsky de son voyage de 1884–1885, pp. 59–59, pl. iv.
3. ALPHÉRAKY, S. *Lépidoptères* rapportés de la Chine et de la Mongolie par G. N. Potanin, pp. 90–123, pl. v.
4. ALPHÉRAKY, S. Le Pamir et sa Faune lépidoptérologique, seconde partie (Spéciale) *Noctuides*. pp. 124–191, pls. vi–viii.
5. CHRISTOPH, H. Neue *Lepidoptera* aus dem Kaukasus, pp. 193–262, pls. ix & x.
6. ALPHÉRAKY, S. Zur *Lepidopteren*-Fauna von Teneriffa (Mit einem Vorwort von Dr. G. Sievers), pp. 203–232, pl. ix.
7. ALPHÉRAKY, S. Sur quelques *Lépidoptères* de la Russie méridionale, pp. 233–240, pl. xii.
749. BOTHERY, G. A. J. Notes on Indian Ants. Tr. E. Soc. 1889, pp. 347–374. [*Hymenoptera*.]
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750. RÜBSAAMEN, E. H. Ueber Gallmücken und Gallen aus der Umgebung von Siegen. B. E. Z. xxxiii, pp. 43–79. [*Diptera*.]
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752. —. Beschreibung neuer Gallmücken und ihrer Gallen. Z. Naturw. lxi, pp. 373–382. [*Diptera*.]
753. RYBAKOW, G. *Insecta* in itinere Cl. N. Przewalski in Asia centrali novissime lecta. xiv. *Chrysomelidae* et *Coccinellidae*. Hor. Ent. Ross. xxiii, pp. 286–290. [*Coleoptera*.]

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755. SANDAHL, O. T. Om insekters förekomst inom den menackliga organismen. Stockholm : 1887-1888, 8vo, 76 pp.
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756. SAUNDERS, E. *Andrena and Stylops*. Ent. M. M. xxv, pp. 293-295. [*Hymenoptera*]
757. SAUNDERS, W. *Insects injurious to fruits*. Second edition. Philadelphia : 436 pp.
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758. SAUSSURE, H. DE. Note sur quelques *Edipodians*, en particulier sur les genres appartenant au type des *Sphingonotus*. MT. schw. ent. Ges. viii, pp. 87-97. [*Orthoptera*.]
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760. SCHATZ, E., & RÜBER, J. Exotische Schmetterlinge. II. Theil. Lieferung 5, pp. 181-224, pls. xxxv-xlii.
761. SCHAUFUSS, L. W. Neue *Scydmeniden* im Museum Ludwig Salvador. B. E. Z. xxxiii, pp. 1-42. [*Coleoptera*.]
762. —. Entgegnung auf E. Reitter's Bemerkungen (1887). Tijdschr. Ent. xxxii, pp. 73-78. [*Coleoptera*.]
763. SCHAUS, W. Descriptions of new species of Mexican *Heterocera*. Ent. Am. v, pp. 87-90. [*Lepidoptera*.]
764. —. Descriptions of new species of Mexican *Heterocera*. T. c. pp. 190-192. [*Lepidoptera*.]
765. SCHILSKY, J. Berichtigungen und Ergänzungen zum Verzeichniss der deutschen Käfer. Deutsche o. Z. 1889, pp. 337-344, and zweiter Theil ; t. c. pp. 357-365. [*Coleoptera*.]
766. SCHLETTERER, A. Die *Hymenopteren*-Gruppe der *Eraniiden*. Ann. Hofmuseum Wien, iv, pp. 107-180, 289-338, & 373-546, pls. vi, vii, & xix-xxii.
767. —. Monographie der Bienen-Gattungen *Chelostoma*, Latr., und *Heriades*, Spin. Zool. Jahrb. Abth. f. Syst. iv, pp. 591-691. [*Hymenoptera*.]
768. —. Nachträgliches über die *Hymenopteren*-Gattung *Cerceris*. T. c. pp. 879-904.

769. [SCHLETTERER, A.] Beitrag zur Kenntniss der *Hymenopteren*-Gattung *Cerceris*, Latr. *T. c.* pp. 1124-1131.
770. —. Monographie der *Hymenopteren*-Gattung *Stephanus*, Jur. *B. E. Z.* xxxiii, pp. 71-159, pl. i.
771. —. Die *Hymenopteren*-Gattungen *Stenophasmus*, Smith, *Monomachus*, Westw., *Pelecinus*, Latr., und *Megalyra*, Westw. *T. c.* pp. 197-250, pl. iii.
772. —. *Hymenopterologisches*. *T. c.* pp. 293-298.
773. SCHMIDT, E. Noch einmal über die Athmung der Larven von *Donacia crassipes*. *T. c.* pp. 299-308.
774. SCHMIDT, F. Die Bildung des Blastoderms und des Keimstreifens der *Musciden*. *SB. Ges. Dorp.* viii, pp. 366-371.
775. SCHMIDT, J. *Histeriden* aus Tripolitanien und Tunesien. *B. E. Z.* xxxiii, pp. 285-288. [*Coleoptera*.]
776. —. Neue *Histeriden* aus Paraguay. *T. c.* pp. 317-324. [*Coleoptera*.]
777. —. Ein blaue *Hololepta*. *Ent. Nachr.* xv, pp. 70-72. [*Coleoptera*.]
778. —. Neue Arten der Gattung *Hister*. *T. c.* pp. 85-96. [*Coleoptera*.]
779. —. Neue *Histeriden*. *T. c.* pp. 329-341 & 361-373. [*Coleoptera*.]
780. —. Neue *Histeriden* aus Afrika. *Deutsche e. Z.* 1889, pp. 153-159. [*Coleoptera*.]
781. SCHNABL, J. Contributions à la faune diptérologique. *Hor. Ent. Ross.* xxiii, pp. 313-347.
782. SCHWARZ, E. A. Termitophilous *Coleoptera* in N. America. *P. E. Soc. Washington*, i, pp. 160 & 161.
783. —. Notes on the food-habits of some N. American *Scolytidae* and their Coleopterous enemies. *T. c.* pp. 163-165. [*Coleoptera*.]
784. SCUDDER, S. H. The Butterflies of the Eastern United States and Canada, with special reference to New England. Vols. I-III. 1958 pp., 89 pls., 3 maps, and 3 frontispieces. Cambridge : 1888, 1889.

This work, the commencement of which was recorded last year, is now complete, as above; the first two volumes give the descriptions of New England butterflies, the third volume those of the Eastern United States and Canada that are not found in New England. The digressive essays are very numerous, and the following are their headings (omitting those mentioned last year): dimorphism and polymorphism; butterflies at night and at sea, out of season and out of place; butterfly sounds; how butterflies winter; butterflies common to the Old and the New World; where did they originate?; the ways of butterflies; the origin and development of ornamentation in butterflies; antigeny, or sexual diversity in butterflies; lethargy in caterpillars; glacial reminders, our oldest New England butterflies; the butterfly fauna of the Eastern United

States, and especially of New England, compared to that of Europe ; the three pioneer students of butterflies in this country ; companionship and commensalism among caterpillars ; the hibernation of caterpillars ; mimicry and protective resemblance, or butterflies in disguise ; fossil butterflies ; the names of butterflies ; hypermetamorphosis in butterflies ; the best localities for collectors ; favourite butterfly haunts ; habit as a guide in classification ; the procession of the seasons ; the adornment of caterpillars ; sexual diversity in legs, wings, and scale arrangement ; length of life in butterflies ; digoneutism in butterflies ; intensity of life in America ; origin of varieties in butterflies, possible and probable ; the friends and associates of caterpillars ; the distribution of butterflies in New England, local butterflies ; psychological peculiarities in our butterflies ; periodicity in the appearance of butterflies ; aromatic butterflies ; the colonization of New England ; the swarming and migrations of butterflies ; color preferences of butterflies ; the origin of colour in butterflies ; protective colouring in caterpillars ; cosmopolitan butterflies ; the spread of a butterfly in a new region ; a study of certain caterpillars ; the butterfly in ancient literature and art ; melanism and albinism ; deceptive devices among caterpillars, or the defences of caterpillars ; southern invaders ; the law of suffusion in butterflies ; effect of cold on development ; odd caterpillars ; variations in habit and in life according to locality and season of the year ; some singular things about caterpillars ; nests and other structures made by caterpillars ; the perils of the egg ; anomalies in geographical distribution ; a budget of curious facts about chrysalids ; what families of plants are preferred by caterpillars ? ; color relations of chrysalids to their surroundings ; butterflies as botanists ; postures at rest and asleep ; the enemies of butterflies ; seasonal dimorphism ; the costal fold and discal streak of skippers ; flight in butterflies ; butterfly vision ; sexual diversity in the form of the scales ; the act of pupation ; the laws of colorational pattern ; how butterflies suck ; odd chrysalids ; monstrosities ; the coloring of butterflies as related to their distribution. A description of the plates will be found in our "Systematic" part, under "*Rhopalocera*."

785. —. Length of life in butterflies. *Canad. Ent.* xxi, pp. 49-51. [*Lepidoptera*.]

—. Cosmopolitan butterflies. *Psyche*, v, pp. 190-192. [*Lepidoptera*.]

787. —. An interesting palæozoic Cockroach fauna at Richmond, Ohio. *P. Bost. Soc.* xxiv, pp. 45-53.

788. SEIDLITZ, G. Fauna Transylvanica. Lief. iii & iv. [*Coleoptera*.]

Familien, pp. xli-xlviii, Gattungen, pp. 49-128, Arten, pp. 241-544 of this work have appeared in 1889. For synonymical notes on this and the Fauna Baltica, *vide* WEISE, *Deutsche c. Z.* 1889, pp. 213-217.

789. —. Fauna Baltica, Lief. iv. [*Coleoptera*.]

Pp. 81-128 Gattungen ; pp. 337-512 Arten, compose this part.

790. —. Ueber die *Coleopteren*-Gattung *Esarcus*, Reiche. *Deutsche c. Z.* 1889, pp. 147-149.

791. SEITZ, A. Ueber Schmetterlingsseier. Zool. Jahrb. Abth. f. Syst. iv, pp. 485-492. [*Lepidoptera*.]

792. —. Lepidopterologische Studien im Ausland. T. c. pp. 771-779 & 905-924.

793. —. Betrachtungen über die Schutz-vorrichtungen der Thiere. Op. cit. iii, pp. 59-96.

Largely devoted to protective resemblance in insects.

794. —. Die Schmetterlingswelt des Monte Corcovado. S. E. Z. i, pp. 325-329 & 351-355. [*Lepidoptera*.]

795. SELYS-LONGCHAMPS, E. DE. *Palæophlebia*, nouvelle légion de *Caloptérygines*, suivi de la description d'une nouvelle *Gomphine* du Japon. C.R. ent. Belg. xxxiii, pp. cliii-clix. [*Neuroptera*.]

Palæophlebia is said to be the most remarkable and abnormal of living *Odonata*, and is allied to fossil forms.

796. —. *Pronseura*, nouveau genre d'*Agrionines* de la légion des *Protonerræ*. T. c. pp. clxxii-clxxiv. [*Neuroptera*.]

797. SÉMENOW, A. V. Ueber einige Arten der Gattungen *Sphenaria*, *Mæn*, und *Asphena*, Sem. Wien. ent. Z. viii, pp. 309 & 310. [*Coleoptera*.]

798. —. *Chlenius lepidus* et *Oodes integer*, espèces nouvelles de l'Asie russe. L'or. Ent. Ross. xxiii, pp. 291-294. [*Coleoptera*.]

799. —. Diagnoses *Coleopterorum* novorum ex Asia centrali et orientali. T. c. pp. 348-403.

800. —. *Buprestis nikolskii*, n. sp. Bull. Mosc. (n.s.) ii, pp. 682-685. [*Coleoptera*.]

801. —. Aperçu des genres paléarctiques de la tribu des *Anchomenides*. T. c. pp. 686-693. [*Coleoptera*.]

Several new generic and subgeneric names are proposed.

802. SEMPER, G. Reisen in Archipel der Philippinen von Dr. C. Semper. Die Tagfalter, Lief. 4, pp. 135-174, pls. xxv-xxxii. [*Lepidoptera*.]

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804. SENNA, A. Contribuzioni allo studio dei *Brentidi*. Bull. Ent. Ital. xxi, pp. 32-37. [*Coleoptera*.]

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The number of species is 303.

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807. —. The Rhynchophorous *Coleoptera* of Japan. Part I. *Attelabida* and *Rhynchitida*. Tr. E. Soc. 1889, pp. 41-74.

808. [SHARP, D.] Two new species of *Scymnus*. *Ins. Life*. i, pp. 364 & 365. [*Coleoptera*.]
809. —. An account of Prof. Plateau's recent experiments on the vision of Arthropods. *Tr. E. Soc.* 1889, pp. 393-408, pl. xiii.
Includes a few criticisms and suggestions.
—, [See also GODMAN & SALVIN (324).]
810. SHAW, E. Synopsis of the British *Orthoptera*. *Ent. M. M.* xxv, pp. 354-359, 365-372, 409-421, & 450-455.
811. SHIPLEY, A. E. On *Lethrus cephalotes*, *Rhynchites betuleti*, and *Chaetocnema basalis*, three species of destructive Beetles. *P. Cambr. Phil. Soc.* vi, pp. 335-340, pl. iii. [*Coleoptera*.]
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817. —. Two New Species of Butterflies. *Tr. Am. Ent. Soc.* xvi, pp. 86 & 87. [*Lepidoptera*.]
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837. —. *Papilio* (*Ornithoptera*) *ritsemæ*, n. sp. Notes Leyd. Mus. xi, p. 153. [*Lepidoptera*.]
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— [See also BUCKLER (110).]

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848. STEIN, P. Ein neuer Dipterenzwitter. Wien. ent. Z. viii, pp. 95 & 96.

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— [See also COTES & SWINHOF (167).]

853. TETENS, H. Ueber Parasiten der Kleinzirpen und das in ihnen entdeckte Jugendstadium der *Dipteren*-Gattung *Chalarus*. Ent. Nachr. xv, pp. 1-3.

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858. [TIEBE, —.] Plateau's Versuche über die Fähigkeit der Insekten Bewegungen wahrzunehmen. *Op. cit.* ix, pp. 309-312.
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- [See also AITCHISON (1) and GODMAN & SALVIN (324)]

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(d.) *North Europe and Siberia* [see also (a.) and (b.)].

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(g.) *Southern Europe and Mediterranean Basin* [see also (a.) (b.) and (f.)].

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QUEDENFELDT (653), and Ueber das Vorkommen von *Calosoma azoricum*, Woll., und *Corynetes finetarius*, Woll.; Ent. Nachr. xv, pp. 319-321.—Egypt: BAUDI (39); SCHMIDT (778).—Asia Minor: FAUST (248); HAURY (367); HELLER (368).—Syria; GROUVELLE (340).—Smyrna; LEFÈVRE (496).

Hymenoptera. ANDRÉ (11); COSTA (163); SCHLETTERER (767); TOURNIER (865).—Andalusia; MEDINA, Act. Soc. Esp. xviii, p. 61.—Sicily; STEFANI (847).—Italy; COSTA (162).—Naples; COSTA (164).—LIEGEL, Ueber Kärntische Hymenopteren; JB. Mus. Kärnt. xx, pp. 172-176.—Egypt and Asia Minor; KOHL (461).—Syria; KOHL & HANDLIRSCH (463).

Lepidoptera. WALKER, P. E. Soc. 1889, p. xxiii.—S. France; JONES, Ent. M. M. xxv, pp. 208 & 209.—Hyères: NORRIS, Ent. xxii, pp. 182-185; WARBURG, l. c. p. 257.—Pyrénées-orientales; OBERTHUR, Bull. Soc. Ent. Fr. (6) ix, pp. cci-cciii.—Spain; RAGONOT (657).—Portugal; CHRIST (145).—Andalusia; SAUTERNAS, Act. Soc. Esp. xviii, pp. 75 & 76.—Algeria; RAGONOT (656).—Sicily: RAGUSA (660); WOCKE (933).—Materiali per la fauna *Lepidopterologica* della Sicilia, cont.; MINÀ-PALUMBO and FAILLA-TEDALDI, Nat. Sicil. viii, pp. 1, &c., &c.—Die Schmetterlinge des Lavantthales: vii, Nachtrag; HÖFNER, JB. Mus. Kärnt. xx, pp. 156-171.

Diptera. MIK (571).—Italy; FICALBI (264).—Dalmatia; BECKER (44).—Carinthia; TIEF (859).—Algeria: BIGOT (71); RÖDER (739).

Rhynchota. NOUALHIER (606).—Algeria: POMEL (643); LETHIERRY (498).

Neuroptera. MACLACHLAN (545).—Italy, *Thysanura*; GRASSI & BOVELLI (334).

Orthoptera. PICTET (630).—Contribuzioni alla fauna degli *Ortotteri* del Trentino; COBELLI, SB. z.-b. Wien, xxxix, pp. 37 & 38.—Turkey; WESTWOOD (922).—Asia Minor; RETOWSKI (702).—Egypt; SAUSSURE (758).

(b.) *Caucasus and Western Asia* [see also (a.) and (b.)].

Insecta. Kirghiz-Steppes; HEYDEN (379).—Afghanistan; AITCHISON (1).

Coleoptera. EPPELSHEIM (227); FAUST (249); HEYDEN, Wien. ent. Z. viii, p. 280; KOENIG (459).—Caucasus: MATTHEWS (558); WEISE (914, 919, 920).—Circassia: CZWALINA (170); REITTER (683, 684).—Mingrelia; REITTER (675).—Transcaucasus; REITTER (691).—Araxes Valley; FAUST (254).—Transcaspian; SÉMENOW (797).—Aral; SÉMENOW (800).—Turkestan; WEISE (916).—Alka-Kul; FAUST (252).—Asiatic Russia; SÉMENOW (798).—Central Asia: STARCK (842); KOENIG (460); RYBAKOW (753); SÉMENOW (799).

Hymenoptera. KOHL (462); MORAWITZ (592).—Transcaspian Region; KOHL & HANDLIRSCH (463).—Turkestan; KIRBY (453).—Persia; SCHLETTERER (770).—Aden; SCHLETTERER (772).

Lepidoptera. HEYLAERTS (385); ROMANOFF (748); STAUDINGER (844).

Diptera. MIK (573).—Persia; RÖDER (741).

Rhynchota. HORVATH (400).

Orthoptera. TURCOMANIA; REDTENBACHER (665).

4. AFRICA (ETHIOPIAN REGION).

Insecta. OATES (608); PREUSS, B. E. Z. xxxiii, pp. 17-29, S.B.

Coleoptera. ALLARD (8, 9, 10); ALLUAUD, Bull. Soc. Ent. Fr. (6) ix, p. cxc; BATES (38); BOURGEOIS (93, 94); CANDÈZE (126, 127); DUVIVIER (208); FAIRMAIRE (239); FAUVEL (261); FAUST (253); FLACH (273); GORHAM (325); GROUVELLE (340); JANSON (419); KOLBE (465); LEFÈVRE (491, 495); LÉVEILLÉ (508); LEWIS (510); MARSEUL (549); RÉGIMBART (667, 668); REITTER (681, 699); RICHTER (711); RITSEMA (726); SCHAUFUSS (761); SCHMIDT (777, 778, 779, 780); WATERHOUSE (905).

Hymenoptera. ANDRÉ (12); KIRBY (452); MEUNIER (564); MOC-SÁRY (586); SCHLETTERER (766, 767, 770, 771).

Lepidoptera. AURIVILLIUS (21); BUTLER (115); CAPRONNIER (128, 129); DEWITZ (184); DRUCE (324, p. 301); ELWES (223); HOLLAND (390); KHEIL (440); KIRBY (449); LEWIS (517); MABILLE (539, 540); RIBBE (705); ROGENHOFER (743, 747); SMITH (825); SMITH & KIRBY (827); STAUDINGER (845, 846); TRIMEN & BOWKER (870); WALSHINGHAM (894).

Diptera. BIGOT (68, 69); KARSCH (433); WULF (940).

Neuroptera. BRAUER (97); KARSCH (426, 427, 430); KIRBY (444, 445).

Orthoptera. BOLIVAR (88); GERSTAECKER (309); KARSCH (428, 435); PICTET (630); WESTWOOD (922); WOOD-MASON (937).

5. MADAGASCAR.

Coleoptera. ALLARD (8); CANDÈZE (126); FAIRMAIRE (240, 242); FAUST (246, 253).

Hymenoptera. MOC-SÁRY (586); POUJADE (646); OBERTHUR, Bull. Soc. Ent. Fr. (6) ix, p. ccxli.

Rhynchota. FALLOU (243).

Neuroptera. KARSCH (425, 434, 436); KIRBY (444, 445).

Orthoptera. KARSCH (428); WESTWOOD (922).

6. TROPICAL AND EASTERN ASIA AND JAPAN. [AFGHANISTAN, see W. AND CENTRAL ASIA, 3 (h.).]

Insecta. WALKER (888).—N. India; MÖWIS (594).

Coleoptera. ALLARD (9, 10); BALY (25); CANDÈZE (126); GAHAN (300); GORHAM (325, 326); POLL (639, 642); RITSEMA (725, 726, 729); SCHAUFUSS (761); SCHMIDT (778, 779); SEMENOW (799); SHARP (807).—Kashmir and Baltistan; BATES (33, 34).—India; ALBERS (6); FAIRMAIRE (237); FAUST (253); RITSEMA (724).—India and Malay Penins.; SHARP (806).—India and Ceylon; JANSON (420).—Andaman Is.;

GROUVELLE (342).—Cochin China : ALLARD (7) ; BATES (36) ; FLEUTIAUX (276) ; LEFÈVRE (490) ; RÉGIMBART (666).—China : FAIRMAIRE (236, 238) ; NONFRIED (605) ; REITTER (699).—China and Mongolia : EPPELSHEIM (228) ; HEYDEN (383) ; JAKOWLEW (416) ; REITTER (700, 701) ; TSHITSCHERINE (872).—China, Mongolia, and Japan : WEISE (914).—Japan : BATES (37) ; FAUST (247) ; FLACH (272).—IWAKAWA, "The Japanese *Coleoptera*," Zool. Mag. i, p. 320.—LEWIS (512, 513, 514), and Ent. M. M. xxv, p. 433 ; MATTHEWS (558) ; REITTER (672, p. 277, 687, 688, 693, 695) ; ROELOFS (737) ; SHARP (806, 807).—Catalog der Coleopteren von Japan ; Erster Nachtrag : SCHÖNFELDT, JB. nass. Ver. xli, pp. 44–49.

Hymenoptera. HANDLIRSCH (361) ; KIRBY (452) ; MOCSÁRY (586) ; MORAWITZ (591) ; ROTHNEY (749) ; SCHLETTERER (766).—Annam ; ANDRÉ (12).—Notes on some bees and wasps from Burma ; BINGHAM, J. Bomb. N. H. Soc. iii, pp. 183–187.—E. India : Our *Hymenoptera* ; WROUGHTON, J. Bomb. N. H. Soc. iv, pp. 26–37.—Mongolia ; RADOSZKOWSKI (655).

Lepidoptera. LEECH (484, 487) ; ROMANOFF (748) ; STAUDINGER (843) ; WALSINGHAM (894).—E. India : BUTLER (113) ; HAMPSON (360) ; NICÉVILLE (600, 601) ; SWINHOE (852).—On the *Lepidoptera* of Karachi and its neighbourhood, part ii ; SWINHOE, J. Bomb. N. H. Soc. iii, pp. 117–134 & 168–183.—Catalogue of moths of India ; COTES & SWINHOE (167).—Tenasserim : DOHERTY (195).—Assam ; DOHERTY (194).—Perak ; HONRATH (395).—Notes on a collection of butterflies made in Burmah between September, 1885, and December, 1886 ; J. Bomb. N. H. Soc. iii, pp. 17–28.—Ceylon ; ROGENHOFER (146).—Formosa ; BUTLER (118).—Japan and Corea ; LEECH (485, 488).—Japan : HOLLAND (391) ; LEECH (486) ; WALSINGHAM (894).

Diptera. BIGOT (68, 69).

Rhynchota. ATKINSON (18) ; DISTANT (186, 187).—India ; ATKINSON (16) ; *id.*, *Coccidæ* (17) ; ATKINSON (19).—E. India : DISTANT (191) ; LETHBRIDGE (500, 501).—N. India ; BERGROTH (59).—Himalaya ; HORVATH (401).—Ceylon ; GREEN, *Coccidæ* (335).

Neuroptera. KIRBY, Revision (444).—Ceylon ; KARSCH (437).—Japan ; SELYS (795).

Orthoptera. PICTET (630) ; WESTWOOD (922) ; WOOD-MASON (935, 936, 937).—Ceylon ; KARSCH (428).

7. ASIATIC ARCHIPELAGO AND PAPUA.

Coleoptera. ALLARD (9, 10) ; Baly (28) ; CANDÈZE (126) ; FAUVEL (260) ; GAHAN (300) ; GORHAM (325) ; LEWIS (510) ; POLL (642, 949) ; SCHMIDT (778, 779) ; SHARP (807).—Java ; RITSEMA (731).—Sumatra : ALBERS (5) ; CANDÈZE (127) ; REITTER (681) ; RITSEMA (723, 730, 732).—Borneo : BATES (35) ; POLL (640) ; SMITH (826).—Philippines ; POLL (641).—Amboyna ; BOURGEOIS (93).—N. Guinea : BRENSKE (101) ; JACOBY (415).

Hymenoptera. KIRBY (452) ; MOCSÁRY (586) ; SCHLETTERER (766, 770).

Lepidoptera. HONRATH (394) ; RIBBE (706) ; SEMPER (802) ; SMITH & KIRBY (827) ; WALSINGHAM (894).—Java ; SNELLEN (834, 837).—Sumatra : HEYLAERTS (383, 384) ; ROGENHOFER (744) ; SNELLEN (833).—Celebes ; MABILLE (537).—I. of Palawan ; STAUDINGER (843).—N. Guinea : MEYRICK (567) ; RAGONOT (658) ; SNELLEN (836).

Diptera. BIGOT (68).

Rhynchota. DISTANT (186, 187, 192).—Borneo ; DISTANT (189).—New Guinea : BERGROTH (58) ; DISTANT (188).

Neuroptera. KARSCH (427, 432) ; KIRBY (444, 445).

Orthoptera. KARSCH (428) ; PICTET (630) ; WESTWOOD (922) ; WOOD-MASON (935, 937).—Philippines ; BOLIVAR (89).

8. AUSTRALIA AND TASMANIA.

Insecta. TRYON (871).

Coleoptera. ALLARD (9, 10, p. cv) ; Baly (28) ; BLACKBURN (73, 74, 75, 76) ; BOURGEOIS (93) ; CANDÈZE (126) ; JANSON (421) ; LEWIS (510) ; LUMHOLZ (534) ; OLLIFF (612) ; POLL (638) ; SLOANE (821) ; SHARP (808) ; WATERHOUSE (905).—Mulwala, Murray River ; SLOANE, *Vict. Nat. vi*, pp. 117 & 118.—Gippsland ; FRENCH, *Vict. Nat. vi*, p. 120.

Hymenoptera. KIRBY (452) ; KOHL (461) ; KRIECHBAUMER (476) ; MOCSÁRY (586) ; SCHLETTERER (766, 771).

Lepidoptera. LUCAS (532, 533) ; MATHEW (557) ; MEYRICK (568) ; MISKIN (582, 583, 584, 585) ; OLLIFF (613) ; WALSINGHAM (894).—Notes on the butterflies of Victoria ; BARNARD, *Vict. Nat. vi*, pp. 83–87.

Diptera. BIGOT (68, 69) ; SKUSE (818, 819, 820).

Rhynchota. MASKELL (555).—Tasmania, *Coccidæ* ; MORGAN, *Ent. M. M.* xxv, p. 353.

Neuroptera. KARSCH (434) ; KIRBY (444).

Orthoptera. WESTWOOD (922) ; WOOD-MASON (935).—*Alectoria superba* ; TEPPER, *Ent. Nachr.* xv, p. 324.

9. NORTH AMERICA.

Insecta. GODMAN & SALVIN (324) ; HOWARD (406).—Some Michigan notes ; TOWNSEND, *Ins. Life*, ii, pp. 42–44.—Colorado ; COCKERELL, *Ent.* xxii, p. 185.—Bermudas ; UHLER (873).—N. American cave-insects ; PACKARD (619).

Coleoptera. ALLARD (9) ; BERGROTH (60) ; BLANCHARD (78) ; BRENDÉL (99) ; CANDÈZE (126) ; CASEY (135, 136, 138) ; CHITTENDEN (139) ; DIETZ (185) ; HAMILTON, *Canad. Ent.* pp. 29 & 101 ; HENSHAW (372) ; HORN (396) ; JF'LICH, *Ent. Am.* v, p. 56 ; MATTHEWS (558) ; RÉGIMBART (669) ; RIVERS (733, 735).—Water beetles ; ROBERTS, *Ent. Am.* v, p. 82.—*Scolytidæ* ; SCHWARZ (783).—SMITH (831) ; *id.*, *Lachno-steria* (832) ; *id.* *Ent. Am.* v, p. 121.—ULKE (875).—KILMAN, Additions to the list of Canadian *Coleoptera* ; *Canad. Ent.* xxi, pp. 108–110 & 134–137.—Lower peninsula of Michigan ; TOWNSEND, *Psyche*, v, pp. 231–235.—A list of the *Buprestidæ* of New England ; BLANCHARD, *Ent. Am.* v, pp. 29–32.—Notes on *Coleoptera* of Peekskill, N.Y. ; SHERMAN, *P. E. Soc.*

Washington, i, p. 162.—Colorado; COCKERELL, *Canad. Ent.* xxi, p. 20, *Ent. M. M.* xxv, p. 186, and *West Am. Scientist*, vi, p. 47.—Illinois; WOODWORTH, *Psyche*, v, p. 169.—San Diego; HOWARD, *West Am. Scientist*, vi, pp. 87 & 88.—Florida; LEWIS (515).—On a collection of *Coleoptera* from St. Augustine, Florida; SCHWARZ, *P. E. Soc. Washington*, i, p. 169.—Collecting notes; WICKHAM, *Ent. Am.* v, pp. 77 & 78.—*Termitophilous Coleoptera*; SCHWARZ (782).

Hymenoptera. ASHMEAD (13); GILLETTE (316); HANDLIRSCH (361); HARRINGTON (364); HOWARD & RILEY (407); JACK, *Psyche*, v, p. 279; KOHL (462); MOCSÁRY (586); RILEY (715); ROBERTSON (736); SCHLETTERER (766, 767, 770).—Florida; HOWARD (403).—Los Angeles; HOWARD (404).

Lepidoptera. ANGELMAN, *Ent. Am.* v, p. 28; BEUTENMULLER (64, 65); DRUCE (324); EDWARDS (218); FERNALD (262); FLETCHER (274); FRENCH (285, 287, 288, 289); GROTE (337), and *Canad. Ent.* xxi, p. 139; HULST, *Epipaschiine* (411); SLOSSON (823)—*Phycitidæ* and *Galleriide*: RAGONOT (659); HULST, *Ent. Am.* v, pp. 155 & 156.—RILEY (716); RIVERS (734); SCUDDER (784); SLOSSON, *Ent. Am.* v, p. 85; SMITH (828, 829); WALSINGHAM (895).—N. W. Canada; GEDDES, *Canad. Ent.* xxi, pp. 57 & 58.—MOFFAT, *Additions to the Canadian list*; *Canad. Ent.* xxi, p. 153.—Ontario: KILMAN, *Canad. Ent.* xxi, p. 240.—SKINNER, *Butterflies at Qu'appelle*; *Canad. Ent.* xxi, pp. 238 & 240.—The White Mountains as a Home for Butterflies; SCUDDER, *Appalachia*, v, pp. 13–22, pl. iv.—Montreal; TRENHOLME, *Canad. Ent.* xxi, p. 120.—N. York; DUZEE, *Canad. Ent.* xxi, p. 39.—Colorado; COCKERELL, *Ent. M. M.* xxv, p. 213.—Pennsylvania; SKINNER & AARON (816).—Florida; SLOSSON (822).—Lower California; SKINNER (817).—Bahamas; DRUCE (202).

EDWARDS, H., *transformations* (216).—Classified list of food-plants of American butterflies; *Psyche*, v, pp. 274–278.

Diptera. BERGROTH (55); BIGOT (68, 69); WILLISTON (928, 930).—Michigan, *Laphria canis*; TOWNSEND, *Ins. Life*, ii, p. 162.—Texas; WILLISTON (929).—California; COQUILLETT (159).

Rhynchota. BERGROTH (58); DUZEE (209, 210, 211, 212); PROVANCHER (648); WEED (912); WOODWORTH (939).—Florida: UHLER (874); HEIDEMANN, *P. E. Soc. Washington*, i, p. 137.—*Coccidæ*: COQUILLETT (158); HOWARD (405).

Neuroptera. HAGEN (353); KIRBY (444).

Orthoptera. BRUNER (107); PICTET (630).—Staten I.; DAVIS (176).—Los Angeles; COQUILLETT, *Ins. Life*, i, p. 227.

10. CENTRAL AMERICA, INCLUDING MEXICO.

Insecta. GODMAN & SALVIN (324); HOWARD (406).

Coleoptera. ALLARD (9); BOURGEOIS (93); CANDÈZE (126); CASEY (136, 137, 138); DUGÈS (206); LEFÈVRE (493); MARSEUL (549); PASCOE (623, 624); SCHMIDT (779); SENNA (804).

Hymenoptera. HANDLIRSCH (361); MOCSÁRY (586); SCHLETTERER (766).

Lepidoptera. DRUCE (202); GODMAN & SALVIN (323); MABILLE (535, 536, 540); SCHLAUS (763, 764).

Diptera. BIGOT (69).

Rhynchota. DUGÈS (205); FALLOU (244).

Neuroptera. DUDLEY (204); KARSCH (431); KIRBY (444).

Orthoptera. BRUNER (107); GERSTAECKER (309); PICTET (630); WESTWOOD (922).

11. ANTILLES. [TRINIDAD, see S. AMERICA; BAHAMAS and BERMUDAS ISLANDS, see N. AMERICA.]

Insecta. SMITH, P. E. Soc. 1889, pp. liii-lix.—St. Lucia; HOWARD (406).

Coleoptera. GAHAN (298).—Guadeloupe; FLEUTIAUX & SALLÉ (277).—Martinique; CANDÈZE, (126) p. 120.

Lepidoptera. BUTLER (116); GODMAN & SALVIN (324); DRUCE (324).—Hayti; SKINNER (817).

Rhynchota. BERGROTH (57, 58).

Neuroptera. KIRBY (444).—Jamaica; KIRBY (446).

Orthoptera. KIRBY (451).

12. SOUTH AMERICA.

Insecta. GODMAN & SALVIN (324).—Chili and Straits of Magellan, Brazil, Abrolhos Is., &c.; HOWARD (406).

Coleoptera. ALLARD (9); BALY (26, 27); BELON (48); BERG (51); BOURGEOIS (93); CANDÈZE (126); DEVIVIER (208); FAIRMAIRE (241); GAHAN (298); GORHAM (325); GROUVELLE (340, 341); HARPER (363); JACOBY (414, 415); KIRSCH (455); LEFÈVRE (492, 493, 494); LÉVEILLÉ (504, 505, 506, 507, 508); LEWIS (510, 511); MARSEUL (549); MATTHEWS (558); NEVINSON (598); NONFRIED (605); PASCOE (623, 624); REITTER (681); RITSEMA (727); SCHMIDT (776, 779, 780, p. 159); SENNA (804); WASMANN (899); WATERHOUSE (904).—Chili; FAIRMAIRE (239); KRAATZ-KOSCHLAU (472); REITTER (692).

Hymenoptera. ASHMEAD (13); HANDLIRSCH (361); KIRBY (453); KRIECHBAUMER (476); MEUNIER (563); MOCÁRY (586); SCHLETTERER (766, 770, 771).—S. America and Trinidad; KIRBY (452).—Trinidad; ANDRÉ (12).

Lepidoptera. DOGNIN (193); DRUCE (202); MABILLE (535, 536, 537, 538); SEITZ (794); WARREN (896).—Trinidad; KIRBY (448).

Diptera. BIGOT (68, 69, 70); WILLISTON (931).

Rhynchota. BERGROTH (57); FALLOU (243, 244).—MacINTIRE, *Coccidæ* (541, 542, 543, 544).—MORGAN, *Coccidæ*; Ent. M. M. xxv, p. 352. —Trinidad; DISTANT (190).

Neuroptera. KARSCH (427, 431, 434); KIRBY (444); SELYS (796).—Chili; KIRBY (445).

Orthoptera. BRUNER (109); GERSTAECKER (309); KIRBY (451); PICTET (630); WESTWOOD (922).—Chili; KARSCH (428).

PALÆO-ENTOMOLOGY.

BRAUER, REDTENBACHER, & GANGLBAUER (98); BROGNIART (104); BUTLER (117); SCUDDER (787).—Note on fossil insects from Commeny; BROGNIART, Bull. Soc. Ent. Fr. (6) ix, p. ccxxxvi.

COLEOPTERA.

Carabidæ.—*Carabocera prisca*, Jura formation of East Siberia, BRAUER, REDTENBACHER, & GANGLBAUER, Mém. Ac. Pétersb. (7) xxxvi, No. 15, p. 18, pl. ii, fig. 23, n. sp.

Chrysomelidæ.—*Timarchopsis czezanowskii*, Jura formation of East Siberia, BRAUER, REDTENBACHER, & GANGLBAUER, Mém. Ac. Pétersb. (7) xxxvi, No. 15, p. 17, pl. ii, fig. 22, n. sp.

LEPIDOPTERA.

Palæocossus jurassicus, Opp., and *Phragmatæcites damesi*, Opp., referred to *Rhynchota*, *Homoptera*; BRAUER, REDTENBACHER, & GANGLBAUER, Mém. Ac. Pétersb. (7) xxxvi, No. 15, pp. 14 & 15.

Lithopsyche, n. g. *Euschmidæ*, for *L. antiqua*, n. sp., Eocene deposits near Cowes; BUTLER, P. Z. S. 1889, p. 294.

DIPTERA.

Culicidæ.—*Mesopsychoda dasyptera*, Jura formation of East Siberia, BRAUER, REDTENBACHER, & GANGLBAUER, Mém. Ac. Pétersb. (7) xxxvi, No. 15, p. 17, pl. ii, fig. 21, n. sp.

RHYNCHOTA.

Palæontina oolitica, Butl., discussed and figured, BRAUER, REDTENBACHER, & GANGLBAUER, Mém. Ac. Pétersb. (7) xxxvi, No. 15, p. 14, pl. ii, fig. 18, n. sp.

Phragmatæcites damesi, Opp., discussed, p. 15, figured, pl. ii, fig. 19, and referred to *Rhynchota*, *Homoptera*; BRAUER, REDTENBACHER, & GANGLBAUER, Mém. Ac. Pétersb. (7) xxxvi, No. 15.

NEUROPTERA.

Ephemeridæ.—*Mesoneta antiqua*, Jura formation of East Siberia, BRAUER, REDTENBACHER, & GANGLBAUER, Mém. Ac. Pétersb. (7) xxxvi, No. 15, p. 4, pl. i, fig. 2, n. sp.

Mesobætis sibirica, Jura formation of East Siberia, BRAUER, REDTENBACHER, & GANGLBAUER, Mém. Ac. Pétersb. (7) xxxvi, No. 15, p. 5, pl. i, fig. 3, n. sp.

Ephemeropsis orientalis, Eichw., discussed, pp. 5 & 6, figured, pl. i, fig. 4; BRAUER, REDTENBACHER, & GANGLBAUER, Mém. Ac. Pétersb. (7) xxxvi, No. 15.

Odonata.—*Palæophlebia synlestoides*, Jura formation of East Siberia, BRAUER, REDTENBACHER, & GANGLBAUER, Mém. Ac. Pétersb. (7) xxxvi, No. 15, p. 6, pl. i, fig. 5, n. sp.

Samarura gigantea, p. 7, fig. 6, *minor*, p. 8, fig. 7, *pulla*, fig. 8, *angusta*, fig. 9, *rotundata*, fig. 10, p. 9, BRAUER, REDTENBACHER, & GANGLBAUER, Mém. Ac. Pétersb. (7) xxxvi, No. 15, n. spp.

Plecoptera.—*Mesoleuctra gracilis*, Jura formation of East Siberia, BRAUER, REDTENBACHER, & GANGLBAUER, Mém. Ac. Pétersb. (7) xxxvi, No. 15, p. 9, pl. ii, fig. 11, n. sp.

Platyperla platypoda, Jura formation of East Siberia, BRAUER, REDTENBACHER, & GANGLBAUER, Mém. Ac. Pétersb. (7) xxxvi, No. 15, p. 10, pl. ii, fig. 12, n. sp.

Mesonemura maakii, Jura formation of East Siberia, BRAUER, REDTENBACHER, & GANGLBAUER, Mém. Ac. Pétersb. (7) xxxvi, No. 15, p. 11, pl. xiii, fig. 2, n. sp.

Panorpata.—*Panorpa hartungi*, Jura formation of East Siberia, BRAUER, REDTENBACHER, & GANGLBAUER, Mém. Ac. Pétersb. (7) xxxvi, No. 15, p. 16, pl. ii, fig. 20, n. sp.

ORTHOPTERA.

Dermaptera.—? *Baseopsis sibirica*, Jura formation of East Siberia, BRAUER, REDTENBACHER, & GANGLBAUER, Mém. Ac. Pétersb. (7) xxxvi, No. 15, p. 3, pl. i, fig. 1, n. sp.

Blattida.—Note on the *Blattæ* of the Carboniferous strata; BROGNIART (104).

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- Aphelogenia frenata* var. *apicalis*, Guadeloupe; FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 361.
- Demetrias annamensis*, *cordicollis*, Hué, BATES, Ann. Soc. Ent. Fr. (6) ix, p. 284, n. spp.
- Dromius triangularis*, E. Turkestan, SÉMENOW, HOR. ENT. ROSS. xxiii, p. 395; *D. alienus*, Hué, BATES, Ann. Soc. Ent. Fr. (6) ix, p. 285 : n. spp.
- Blechnus annamensis*, Hué, BATES, Ann. Soc. Ent. Fr. (6) ix, p. 285, n. sp.
- Arsinoe salvadorensis*, W. Africa, KOLBE, S. E. Z. I, p. 122, n. sp.
- Lebia humeralis*, Dej., = (*halomera*, Chaud.) ; HEYDEN, p. 202, Wien. ent. Z. viii. *L. xanthophana*, Bates, var. described; BATES, P. Z. S. 1889, p. 218.

L. prattiana, p. 218, *callitrema*, p. 219, Ichang, BATES, P. Z. S. 1889 ;
L. (Astata) humpatensis, W. Africa, BATES, p. 201, Notes Leyd. Mus. xi :
 n. spp.

Amblystomus biguttatus, Motsch., *'guttula*, Dej., characters of ; BATES,
 Ann. Soc. Ent. Fr. (6) ix, p. 271.

A. dromioides, Saigon, BATES, Ann. Soc. Ent. Fr. (6) ix, p. 272, n. sp.

Physodera parvicollis, Hongkong, p. 252, *cyanipennis*, Celebes, p. 253,
amplicollis, Java, p. 254, POLL, Notes Leyd. Mus. xi, n. spp.

Tetragonoderus sulcipennis, Madagascar, FAIRMAIRE, C.R. ent. Belg.
 xxxiii, p. vi, n. sp.

Hypercosmeton, n. g., for *H. callistoides*, n. sp., Ordubad, pl. iv, fig. 4 ;
 REITTER, p. 291, Wien. ent. Z. viii.

Musoreus castaneescens, Madagascar, FAIRMAIRE, C.R. ent. Belg. xxxiii,
 p. vi, n. sp.

Perigona ruficollis, Motsch., var. noticed ; BATES, Ann. Soc. Ent. Fr.
 (6) ix, p. 273.

P. guadeloupensis, Antilles, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr.
 (6) ix, p. 367, n. sp.

Rhombodera picea, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent.
 Fr. (6) ix, p. 362, n. sp.

Thyreopteris oberthurii, Madagascar, FAIRMAIRE, C.R. ent. Belg. xxxiii,
 p. xc, n. sp.

Eurydera communimacula, Madagascar, FAIRMAIRE, C.R. ent. Belg.
 xxxiii, p. vi, n. sp.

Pseudomorpha cylindrica, Texas, CASEY, Ann. N. York Ac. v, p. 40, n. sp.

Pachyteles delauneyi, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent.
 Fr. (6) ix, p. 362, pl. vii, fig. 3, n. sp.

Siagona crassidens, Cochin China, BATES, Ann. Soc. Ent. Fr. (6) ix,
 p. 263, n. sp.

Coscinia signata, Transcaspien region, SÉMENOW, Hor. Ent. Ross. xxiii,
 p. 394, n. sp.

Ditonus rugifrons, Askhabad, REITTER, p. 369, Deutsche e. Z. 1889,
 n. sp.

Anthia hottentotta, Matabele Land, WESTWOOD, in Oates' Matabele
 Land, ed. ii, p. 368, pl. viii, fig. 3 ; *A. ooptera*, p. 202, *niveicincta*, p. 203,
 Trop. Africa, BATES, Notes Leyd. Mus. xi : n. spp.

Netrodera vethi, Benguela, BATES, p. 204, Notes Leyd. Mus. xi, n. sp.

Eutoma (Carenum) sumptuosum, Westw., note on ; BLACKBURN, p. 445,
 P. Linn. Soc. N.S.W. (2) iv.

Euryscaphus minor, Mcl., = (*arenarius*, Sloane) ; SLOANE, Vict. Nat.
 vi, p. 117.

Aulacillus, n. g., near *Huplogaster*, p. 204, for *A. liberianus*, n. sp., W.
 Africa, p. 205 ; BATES, Notes Leyd. Mus. xi.

Cleina trapezicollis referred to *Psilus* ; BATES, Bull. Soc. Ent. Fr. (6)
 ix, p. ccxl.

C. bacillaria, p. 261, *trapezicollis*, p. 263 (*cf. supra*), Cochin China, BATES,
 Ann. Soc. Ent. Fr. (6) ix, n. spp.

Ardistomis laristriata, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc.
 Ent. Fr. (6) ix, p. 363, pl. vii, fig. 4, n. sp.

Craspedophorus buttneri, congoanus, West Africa, KOLBE, S. E. Z. 1, p. 116, n. spp.

Stomoxenus longulus, p. 205, *complanatus*, p. 206, W. Africa, BATES, Notes Leyd. Mus. xi, n. spp.

Brachonychus perraudierei, Cochinchina, BATES, Ann. Soc. Ent. Fr. (6) ix, p. 264, n. sp.

Loricera ovipennis, China, p. 390, *obsoleta*, N.E. Thibet, p. 391, SÉMENOW, Hor. Ent. Ross. xxiii, n. spp.

Chlenius sykesii, Hope, noted as omitted from Munich Catalogue, and referred to subg. *Homalolachnus*; BATES, p. 207, Notes Leyd. Mus. xi. *C. tomentosus*, Say, structure of epipharynx; PACKARD, Psyche, v, p. 227.

C. lepidus, S. Altai, SÉMENOW, Hor. Ent. Ross. xxiii, p. 291; *C. ancho-menoides*, Kashmir, BATES, P. Z. S. 1889, p. 212; *C. pumilio*, *ocularis*, *fraternus*, W. Africa, KOLBE, S. E. Z. 1, p. 118; *C. cambodiensis*, Pnomh-Penh, BATES, Ann. Soc. Ent. Fr. (6) ix, p. 266; *C. (Homalolachnus) rethi*, W. Africa, BATES, p. 206, Notes Leyd. Mus. xi : n. spp.

Callistus acuticollis, Yunnan, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 6, n. sp.

Callistomimus quadrimaculatus, *dilaceratus*, W. Africa, Kolbe, S. E. Z. 1, p. 119, n. spp.

Holosoma, n. g., near *Oodes*, p. 388, for *H. opacum*, n. sp., China, p. 389; SÉMENOW, Hor. Ent. Ross. xxiii.

Oodes prolixus, Bates, = (*integer*, Sém., *infra*); HEYDEN, p. 202, Wien. ent. Z. viii.

O. integer, Wladiwostok, SÉMENOW, Hor. Ent. Ross. xxiii, p. 293; *O. (Simous) borneensis*, Borneo, BATES, P. Z. S. 1889, p. 384 : n. spp.

Orescius oertzeni, Greece, REITTER, p. 251, Deutsche e. Z. 1889, n. sp.

Licinus convexus, Persia, HEYDEN, Deutsche e. Z. 1889, p. 326, n. sp.

Leptorembus, n. g., for *L. flavomaculatus*, n. sp., W. Africa; KOLBE, S. E. Z. 1, p. 117.

Crplostoma, n. g., *Licinides*, p. 386, for *C. insigne*, n. sp., Turkestan, p. 387; SÉMENOW, Hor. Ent. Ross. xxiii.

Rhembus and *Ec-optognius*, their distinctions discussed; BATES, Ann. Soc. Ent. Fr. (6) ix, p. 267.

Brosicus declivis, Turkestan, *potanini*, p. 392, *przewalskii*, p. 393, N.E. Thibet, SÉMENOW, Hor. Ent. Ross. xxiii, n. spp.

Craspedonotus margellanicus, Kr., = (*Pseudobrosicus leucocnemis*, Sém.), generic characters noticed; SÉMENOW, p. 60, Wien. ent. Z. viii.

Eustomis, n. subg. of *Stomis*, for *S. formosus*, n. sp., E. Turkestan; SÉMENOW, p. 378, Hor. Ent. Ross. xxiii.

Daptus komarowi, Transcaspiian region, SÉMENOW, Hor. Ent. Ross. xxiii, p. 385, n. sp.

Ozycentrus foveicollis, Cambodia, BATES, Ann. Soc. Ent. Fr. (6) ix, p. 268, n. sp.

Orthogonius brevilabris, W. Africa, KOLBE, S. E. Z. 1, p. 115, n. sp.

Amblygnathus vitrari, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 364, n. sp.

Anisodactylus abaculus, W. Africa, BATES, p. 207, Notes Leyd. Mus. xi, n. sp.

Hypharpax deyrollei, note on ; BLACKBURN, p. 1387, P. Linn. Soc. N.S.W. (2) iii.

Gynandropus guadeloupensis, Antilles, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 365, n. sp.

Hypolithus cyaneotinctus, *cyanelus*, Cochin China, BATES, Ann. Soc. Ent. Fr. (6) ix, p. 269, n. spp.

Harpalus : structure of tarsal clothing ; PERO (627). *H. faunus*, Say, structure of epipharynx ; PACKARD, Psyche, v, p. 227.

H. kashmirensis, *idiotus*, Kashmir, BATES, P. Z. S. 1889, p. 213 ; *H. tjanschanicus*, E. Turkestan, p. 383, *ganssuensis*, *amdoensis*, China, p. 384, SÉMENOW, Hor. Ent. Ross. xxiii : n. spp.

Harpalodema punctipenne, *bradytoides*, Transcaucasus, REITTER, p. 274, Deutsche e. Z. 1889, n. spp.

Platymetopus punctulicollis, p. 269, *lætulus*, *indochinensis*, *tritulus*, p. 270, Cochin China, BATES, Ann. Soc. Ent. Fr. (6) ix, n. spp.

Acupalpus annamensis, p. 272, *ovatulus*, p. 273, Cochin China, BATES, Ann. Soc. Ent. Fr. (6) ix, n. spp.

Trigonotoma perraudierei, Cochin China, BATES, Ann. Soc. Ent. Fr. (6) ix, p. 275, n. sp.

Drimostoma cordicolle, W. Africa, KOLBE, S. E. Z. 1, p. 121, n. sp.

Abucetus lophoides, Cambodia, BATES, Ann. Soc. Ent. Fr. (6) ix, p. 277, n. sp.

Pacilus cupreus, *versicolor*, note on ; BORRE, C.R. ent. Belg. xxxiii, p. li.

P. kamberskyi, Araxes Valley, REITTER, p. 18, Deutsche e. Z. 1889 ; *P. polychromus*, p. 195, *opulentus*, *alexandrae*, p. 196, China, TSHITSCHERINE, Hor. Ent. Ross. xxiii : n. spp.

Haptoderus maximus, p. 190, *szetschuanensis*, p. 191, China, TSHITSCHERINE, Hor. Ent. Ross. xxiii, n. spp.

Eurythorax, n. subg., near *Haptoderus*, for *E. haptoderoides*, n. sp., China ; TSHITSCHERINE, Hor. Ent. Ross. xxiii, p. 192.

Platyderus haberhaueri, Buchara, HEYDEN, p. 326, Deutsche e. Z. 1889, n. sp.

Sarticus, revision of the genus ; SLOANE, P. Linn. Soc. N.S.W. (2) iv, pp. 500-512.

S. macleayi, p. 504, *habitans*, p. 508, *monarensis*, p. 509, Australia, SLOANE, P. Linn. Soc. N.S.W. (2) iv, n. spp.

Bothriopterus kanssuensis, China, TSHITSCHERINE, Hor. Ent. Ross. xxiii, p. 194, n. sp.

Aphaonus pseudopercus, Circassia, REITTER, p. 97, Wien. ent. Z. viii, n. sp.

Tupinopterus : note on its characters, and on the species of *Pterostichus* in which the seta on hind angle of thorax is wanting ; GANGLBAUER, p. 51, Deutsche e. Z. 1889. *T. laticornis* n. var. *kapparicola* ; GANGLBAUER, p. 49, Deutsche e. Z. 1889.

T. insularis, Greece, GANGLBAUER, p. 49, Deutsche e. Z. 1889 ; *T. ætolicus*, Greece, GANGLBAUER, p. 126, Deutsche e. Z. 1889 : n. spp.

Feronia, structure of tarsal clothing ; PERO (627).

Pterostichus reiseri, Bosnia, GANGLBAUER, p. 47, Deutsche e. Z. 1889 :

P. corax, Greece, GANGLBAUER, p. 52, Deutsche e. Z. 1889; *P. potanini*, p. 185, *validior*, miles, p. 187, Kansu, *singularis*, Amdo, p. 188, TSHITSCHERINE, Hor. Ent. Ross. xxiii; *P. johnsoni*, Oregon, ULKE, Ent. Am. v, p. 59; *P. (Lyrothorax) reitteri*, W. Caucasus, STARCK, p. 311, Wien. ent. Z. viii : n. spp.

Pseudadelosia, n. subg., p. 197, for *P. punctatipennis*, p. 197, *lævipunctata*, p. 198, n. spp., Kansu; TSHITSCHERINE, Hor. Ent. Ross. xxiii.

Molops, revision of the species; GANGLBAUER, pp. 113-125, Deutsche e. Z. 1889. *M. piliferus* n. var. *depilatus*, Kashmir; BATES, P. Z. S. 1889, p. 214.

M. bosnica, Bosnia, p. 116, *grandiceps*, Croatia, p. 121, *austriaca*, Europe, p. 124, GANGLBAUER, Deutsche e. Z. 1889, n. spp.

Zabrus oertzeni n. var. *creticus*; REITTER, p. 253, Deutsche e. Z. 1889.

Z. araxides, Araxes Valley, REITTER, p. 17, Deutsche e. Z. 1889; *Z. chiosanus*, Chios, REITTER, p. 252, Deutsche e. Z. 1889; *Z. przewalskii*, Thibet, p. 380, *potanini*, China, p. 382, SÉMENOW, Hor. Ent. Ross. xxiii : n. spp.

Anara (Amathites) hyalina, Chingan Mountains, SÉMENOW, Hor. Ent. Ross. xxiii, p. 379, n. sp.

Cyclothorax insularis, Motsch., *Anchomenus ambiguus*, Er., and *C. punctipennis*, MacL., note on their characters; BLACKBURN, p. 1388, P. Linn. Soc. N.S.W. (2) iii.

C. obsoletus, p. 1389, *fortis*, p. 1390, *cinctipennis*, p. 1391, *perypoides*, p. 1392, S. Australia, BLACKBURN, P. Linn. Soc. N.S.W. (2) iii, n. spp.

Taphocenusa gracilicollis, Transcaspian region, SÉMENOW, Hor. Ent. Ross. xxiii, p. 375, n. sp.

Stenolepta, n. g. (see also below), near *Tuphozenus*, for *S. cylindrica*, n. sp., Kirghis desert, with var. *transcaspica*; SÉMENOW, Hor. Ent. Ross. xxiii.

Pseudotaphozenus brevipennis, N.E. Thibet, p. 370, *parvulus*, Turkestan, p. 371, *reflexipennis*, p. 372, *potanini*, p. 373, Ordoss, *gracillimus*, Turkestan, p. 374, SÉMENOW, Hor. Ent. Ross. xxiii, n. spp.

Pristonychus kashmirensis, Kashmir, BATES, P. Z. S. 1889, p. 214; *P. allicola*, Himalaya, FAIRMAIRE, Bull. Soc. Ent. Fr. (6) ix, p. xvi; *P. davidis*, p. 7, *sulcipennis*, p. 8, Moupin, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix : n. spp.

Antisphodrus bosnicus, Bosnia, p. 369, REITTER, Deutsche e. Z. 1889, n. sp.

Pristodactyla lacerans, Kashmir, BATES, P. Z. S. 1889, p. 214; *P. agonoides*, Ichang, BATES, P. Z. S. 1889, p. 218 : n. spp.

Anchomenides: SÉMENOW tabulates the genera and subgenera of the Palearctic region, proposing the following new names:—*Chlæniominus*, n. g., type *C. gracilicollis*, Jak., p. 687; *Stenolepta*, n. g., type *S. cylindrica*, Sem., p. 688; *Morphodactyla*, n. g., type *M. potanini*, Sem., p. 690; *Paradoliclus*, n. g., p. 691, type *P. przewalskii*, Sem.; *Acalathus*, n. g., p. 691, type *A. semirufescens*, Sem.; *Agonopsis*, n. subg. of *Anchomenus*, p. 692: SÉMENOW, Bull. Mosc. (n.s.) ii.

Acalathus, n. g. (but see above), for *A. semirufescens*, n. sp., N.E. Thibet; SÉMENOW, p. 365, Hor. Ent. Ross. xxiii.

Calathus korax, p. 253, *ellipticus*, p. 254, Greece, REITTER, *Deutsche e. Z.* 1889; *C. obscuripennis*, Ordubad, REITTER, p. 18, *Deutsche e. Z.* 1889; *C. tenuestriatus*, Moupin, FAIRMAIRE, *Ann. Soc. Ent. Fr.* (6) ix, p. 8; *C. potanini*, p. 360, *fullax*, p. 361, *pseudomorphus*, p. 362, China, SÉMENOW, *Hor. Ent. Ross.* xxiii : n. spp.

Morphodactyla, n. g. (but see above), near *Thermoscelis*, p. 366, for *M. potanini*, n. sp., China, p. 367; SÉMENOW, *Hor. Ent. Ross.* xxiii.

Dolichus chinensis, Ganssu, SÉMENOW, *Hor. Ent. Ross.* xxiii, p. 368, n. sp.

Paradolichus, n. g. (but see above), p. 368, for *P. przewalskii*, n. sp., N.E. Thibet, p. 369; SÉMENOW, *Hor. Ent. Ross.* xxiii.

Leptogathus fugax, Lord Howe I., OLLIFF, *Lord Howe Island*, p. 78, n. sp.

Anchomenus brunneoniger, W. Africa, KOLBE, *S. E. Z.* 1, p. 120; *A. (Agonum) mesostictus*, Kashmir, BATES, *P. Z. S.* 1889, p. 215 : n. spp.

Agonopsis, n. subg. (see above) of *Anchomenus*, for *A. humerosus*, n. sp., N.E. Thibet; SÉMENOW, p. 359, *Hor. Ent. Ross.* xxiii.

Megalonychus explanatus, W. Africa, BATES, p. 208, *Notes Leyd. Mus.* xi, n. sp.

Arhytinus, n. g., near *Olisthopus*, p. 378, for *A. bambidioides*, n. sp., Hué, p. 279; BATES, *Ann. Soc. Ent. Fr.* (6) ix.

Euleptus albicornis, *foveolatus*, W. Africa, KOLBE, *S. E. Z.* 1, p. 121, n. spp.

Euplynes limbipennis, Hué, BATES, *Ann. Soc. Ent. Fr.* (6) ix, p. 297; *E. auro-cinctus*, Borneo and Sumatra, BATES, *P. Z. S.* 1889, p. 384 : n. spp.

Dyscolus hilaris, Lord Howe I., OLLIFF, *Lord Howe Island*, p. 78, n. sp.

Colpodes ganssuensis, China, SÉMENOW, *Hor. Ent. Ross.* xxiii, p. 357; *C. melittus*, *eulabes*, Kashmir, BATES, *P. Z. S.* 1889, p. 215; *C. davidis*, *parens*, p. 9, *cardioderus*, p. 10, Moupin, FAIRMAIRE, *Ann. Soc. Ent. Fr.* (6) ix; *C. fryi*, N. Borneo, BATES, *P. Z. S.* 1889, p. 384 : n. spp.

Chlenionimus, n. g. (but see above) (*Anchomenides*) for *Chlenius gracilicollis*, Jak.; SÉMENOW, p. 296, *Hor. Ent. Ross.* xxiii.

Patrobis assimilis, Chd., characters of; REITTER, p. 231, *Wien. ent. Z.* viii.

Platidius przewalskii, N.E. Thibet, SÉMENOW, *Hor. Ent. Ross.* xxiii, p. 356, n. sp.

Pogonus ordosicus, China, SÉMENOW, *Hor. Ent. Ross.* xxiii, p. 355, n. sp.

Trechus obtusiusculus, Bosnia, GANGLBAUER, p. 48, *Deutsche e. Z.* 1889, n. sp.

Trechus (Anophthalmus) herculis, Hungary, FRIVALDSZKY, *Term. füzetek.* xi, p. 159, n. sp.

Anophthalmus sp., larva described, pp. 76-78, pl. xx, figs. 6, &c.; *tellkampfi*, *tenuis*, variation, pp. 79 & 80; *tellkampfi*, brain anatomy, p. 115, pl. xxii, figs. 1-4; PACKARD, *Mem. Nat. Ac. Sci.* iv.

Tachypus nubifer, Mor. = (*semilucidus*, Motsch.); SÉMENOW, *Wien. ent. Z.* viii, p. 60.

T. transcaspicus, Transcaspian region, SÉMENOW, *Hor. Ent. Ross.* xxiii, p. 354, n. sp.

Tachys putzeysi, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 368 ; *T. (Barytachys) deliciolus*, Saïgon, BATES, Ann. Soc. Ent. Fr. (6) ix, p. 274 : n. spp.

Bembidium quadrimaculatum, L., injurious to strawberries ; LINTNER, Rep. N. Y. Mus. xl, p. 98. *B. inustum*, Duv., = (*Pseudolimnæum eichoffi*, Kr.) ; KRAATZ, p. 395, Deutsche e. Z. 1889.

B. sulcipenne, p. 273, *quadristammeum*, p. 274, Caucasus, REITTER, Deutsche e. Z. 1889 ; *B. (Peryphus) bracculatum, dardum*, Kashmir, BATES, P. Z. S. 1889, p. 212 : n. spp.

HALIPLIDÆ, DYTISCIDÆ.

[Cf. BLACKBURN (75), FLEUTIAUX & SALLÉ (277), RÉGIMBART (666, 667, 668, 669).]

Haliplus pulchellus, Clk., variation noticed ; RÉGIMBART, Ann. Soc. Ent. Fr. (6) ix, p. 147.

Pronoterus obscuripennis, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 369, n. sp.

Canthydrus luctuosus, Aubé, variation noticed, = (*morsbachi*, Whn., *angularis*, Shp.) ; RÉGIMBART, Ann. Soc. Ent. Fr. (6) ix, p. 148 & 149. *C. subsignatus*, figured, pl. vii, fig. 6 ; Ann. Soc. Ent. (6) ix.

C. bifusciatus, p. 148, *fulvescens*, p. 149, Cochin China, RÉGIMBART, Ann. Soc. Ent. Fr. (6) ix ; *C. bovillæ*, Australia, BLACKBURN, p. 446, P. Linn. Soc. N.S.W. (2) iv ; *C. binotatus*, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 370 : n. spp.

Hydrocanthus micans redescribed ; *H. indicus* var. of : RÉGIMBART, p. 49, Notes Leyd. Mus. xi.

Laccophilus tenuilatus, trilineola, p. 52, *flavopictus*, p. 53, Trop. Africa, RÉGIMBART, Notes Leyd. Mus. xi ; *L. similis* (Whn.), p. 150 (possibly *flexuosus*, Aubé, p. 151), *sharpi* = (*flexuosus*, Shp., nec Aubé), p. 151, *ellipticus*, p. 152, Cochin China, RÉGIMBART, Ann. Soc. Ent. Fr. (6) ix : n. spp.

Derovatellus africanus, Humpata, RÉGIMBART, p. 55, Notes Leyd. Mus. xi ; *D. assinicus*, E. Africa, RÉGIMBART, Ann. Soc. Ent. Fr. (6) ix, p. 248 : n. spp.

Hydrocatus parallelus, Trop. Africa, RÉGIMBART, p. 54, Notes Leyd. Mus. xi, n. sp.

Hyphydrus rufus, Clk., note on ; RÉGIMBART, Ann. Soc. Ent. Fr. (6) ix, p. 152.

H. cycloides, Trop. Africa, RÉGIMBART, p. 56, Notes Leyd. Mus. xi ; *H. alluaudi*, p. 247, *assinicus*, p. 248, E. Africa, RÉGIMBART, Ann. Soc. Ent. Fr. (6) ix : n. spp.

Bidessus annamita, p. 153, *circulatus*, p. 154, Cochin China, RÉGIMBART, Ann. Soc. Ent. Fr. (6) ix, n. spp.

Hydroporus celatus and *alliea*, synonymy ; FAUVEL, Bull. Soc. Ent. Fr. (6) ix, p. lxxi. *H. celatus, longulus*, p. xli, *nevadensis*, p. xlii, noticed ; RÉGIMBART, Bull. Soc. Ent. Fr. (6) ix.

Herophydrus ritsemæ, Trop. Africa, RÉGIMBART, p. 57, Notes Leyd. Mus. xi, n. sp.

Copelatus debilis, Shp., p. 58, *striatulus*, Aubé, p. 59, *varietal notes*; RÉGIMBART, Notes Leyd. Mus. xi.

Lanceles (sub *Anisomera*) *clausii*, Mull., = (*angustissimus*, Rég.); FAIRMAIRE, Bull. Soc. Ent. Fr. (6) ix, p. xc.

Rhantus suturalis, Lac., dimorphic ♀ to be called *vermicularis*; FAUVEL, Rev. d'Ent. viii, p. 82.

Colymbetes dolabratus, *groenlandicus*, *drewneni*, *thomsoni* are varieties of one species; RÉGIMBART, Bull. Soc. Ent. Fr. (6) ix, pp. xvii & xviii.

Dytiscus sp., structure of epipharynx; PACKARD, Psyche, v, p. 227.

Hydaticus sobrinus, *leander*, *exclamationis*, *petiti*, notes on variation of; RÉGIMBART, pp. 60–62, Notes Leyd. Mus. xi. *H. luczonicus*, Aubé, *varietal note*; RÉGIMBART, Ann. Soc. Ent. Fr. (6) ix, p. 154.

H. platamboides, E. Africa, RÉGIMBART, Ann. Soc. Ent. Fr. (6) ix, p. 249, n. sp.

Ethionectes optatus, Shp., noticed; RÉGIMBART, Ann. Soc. Ent. Fr. (6) ix, p. 249.

Cybister granulatus, note on; BLACKBURN, p. 1393, P. Linn. Soc. N.S.W. (2) iii. *C. distinctus*, Reg., var. noticed; RÉGIMBART, p. 62, Notes Leyd. Mus. xi.

GYRINIDÆ.

[Cf. RÉGIMBART (667, 668), SEVERIN (805).]

Catalogue of the species of *Gyrinidæ*; SEVERIN, Ann. Ent. Belg. xxxiii, pp. 149–179.

Gyrinus, the Sicilian species; RAGUSA, Nat. Sicil. ix, p. 9. *G. natator*, habits, &c.; FISCHER-SIGWART, MT. Aargau Ges. v, p. 148.

Orectogyrus kelleni, Trop. Africa, RÉGIMBART, p. 62, Notes Leyd. Mus. xi; *O. alluandi*, E. Africa, RÉGIMBART, Ann. Soc. Ent. Fr. (6) ix, p. 250 : n. spp.

HYDROPHILIDÆ.

[Cf. BLACKBURN (75), BORRE (92), FLEUTIAUX & SALLÉ (277), KUWERT (479), REITTER (676), WEIS (913).]

Hydrophilus piceus, embryology; GRABER, Denk. Ak. Wien. lv, pp. 122–128, pl. i, figs. 6–9, pl. ii, figs. 10–14: habits, formation of egg-sac; FISCHER-SIGWART, MT. Aargau Ges. v, pp. 139–141: duration of life of; WEIS (913).

Philhydrus burruandensis, Australia, BLACKBURN, p. 447, P. Linn. Soc. N.S.W. (2) iv, n. sp.

Berosus spinosus and *guttalis*, Rey, characters of; FAUVEL, Rev. d'Ent. viii, p. 335.

B. guadeloupensis, p. 376, *tessellatus* (Dej.), p. 377, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix; *B. auriceps*, Australia, BLACKBURN, p. 447, P. Linn. Soc. N.S.W. (2) iv : n. spp.

Cercyon circumcinctum, Greece, REITTER, p. 254, Deutsche e. Z. 1889; *C. (Pelosoma) rufipes*, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 378 : n. spp.

PLATYPSYLLIDÆ.

[*Cf.* RILEY (714).]

Platypsyllus, larva noticed; HORN, P. E. Soc. Washington, i, p. 144.
P. castoris, larva, and some details of structure; RILEY, *Ina. Life*, i, pp. 300-307, woodcuts.

STAPHYLINIDÆ.

[*Cf.* CASEY (135, 136, 137, 138), CZWALINA (169, 170), EPPELSHEIM (226, 227, 228, 229, 653), FAIRMAIRE (236), FAUVEL (257, 258, 260, 261), FLEUTIAUX & SALLÉ (277), KOLBE (465), OLLIFF (610), QUEDENFELDT (653), REITTER (672, 698), SHARP (806), WASMANN (899, 900, 901).]

Notes on the synonymy of Philippi's *Catalogo de los Coleópteros de Chile*; FAUVEL, *Rev. d'Ent.* viii, p. 60.

Aleocharides.

Aleochara procera and *spadicea*, Er., noted as one species; KRAATZ, *Deutsche e. Z.* 1889, p. 220.

A. (Ceranota) caucasica, Novorossiisk, EPPELSHEIM, p. 11, *Wien. ent. Z.* viii; *A. (C.) cingulata*, Smyrna, p. 164, *luteipennis*, Turkey, p. 165, *libanica*, Syria, p. 166, *A. (Baryodma) leptocera*, Turkey, p. 167, EPPELSHEIM, *Deutsche e. Z.* 1889: n. spp.

Ceranota melichari, Dalmatia, REITTER, p. 370, *Deutsche e. Z.* 1889, n. sp.

Oxyopoda antipodum, New Caledonia, FAUVEL, *Rev. d'Ent.* viii, p. 278, n. sp.

Porus ochraceus and *ferrugineus* are one species; the sexual characters noticed; FAUVEL, *Rev. d'Ent.* viii, p. 285.

Bolitochara numeensis, New Caledonia, FAUVEL, *Rev. d'Ent.* viii, p. 280 n. sp.

Dinarda dentata and *markelii*, life-histories, habits; *D. dentata*, larva described; WASMANN, *Wien. ent. Z.* viii, pp. 152-162.

D. hagensii, Siebenburgen, WASMANN, p. 282, *Wien. ent. Z.* viii, n. sp.

Liogluta hypnorum, Kr., nec Ksw., note on; KRAATZ, p. 220, *Deutsche e. Z.* 1889.

Homalota planifrons, Wat, and *debilicornis*, Kr., are one species; KRAATZ, *Deutsche e. Z.* 1889, p. 220.

H. (Philhygra) schneideri, Apennines, p. 168, *H. (Geostiba) korbi*, Spain, p. 170, EPPELSHEIM, *Deutsche e. Z.* 1889; *H. (Atheta) æquiventris*, Tripolis, EPPELSHEIM, B. E. Z. xxxiii, p. 315: n. spp.

Leptusa syriaca, Syria, p. 161, *fauveli*, Transcaucasus, p. 162, *impennis*, Apennines, p. 163, EPPELSHEIM, *Deutsche e. Z.* 1889, n. spp.

Ocyusa longicollis, Apennines, EPPELSHEIM, p. 171, *Deutsche e. Z.* 1889, n. sp.

Xenistusa cavernosa, *fossata*, *pressa*, noticed; SCHWARZ, P. E. Soc. Washington, i, p. 161.

Brachida elevata, New Caledonia, FAUVEL, *Rev. d'Ent.* viii, p. 270, n. sp. 1889. [VOL. XXVI.]

Thectura varicolor, New Caledonia, FAUVEL, *Rev. d'Ent.* viii, p. 271, n. sp.

Oligota ventralis, rudella, New Caledonia, FAUVEL, *Rev. d'Ent.* vii, p. 271, n. spp.

Ecitomorpha, n. g., p. 185, for *E. arachnoides*, pl. i, figs. 1-6, *simulans*, figs. 7 & 8, n. spp., S. Brasil [*cf.* also p. 414, t. c.]; WASMANN, *Deutsche* e. Z. 1889.

Termitogaster, n. g., p. 384, for *T. insolens*, n. sp., Panama, p. 386; CASEY, *Ann. N. York Ac.* iv.

Termitogaster fissipennis, Panama, CASEY, *Ann. N. York Ac.* v, p. 187, n. sp.

Abroteles, n. g. *Alseoharini*, p. 190, for *A. beaumonti*, n. sp., Panama, p. 191, with larva ♀, p. 197; CASEY, *Ann. N. York Ac.* v.

Perinthus, n. g. *Alseoharini*, p. 192, for *P. dudleyanus*, n. sp., Panama, p. 194, with larva, p. 196; CASEY, *Ann. N. York Ac.* v.

Xenoccephalus and *Vatesus*, note on; WASMANN, p. 190, *Deutsche* e. Z. 1889.

Tachyporides.

Mycetoporus confusus, Lenkoran, EPPELSHEIM, p. 14, *Wien. ent. Z.* viii, n. sp.

Cilea densata, exul, cinctipennis, New Caledonia, FAUVEL, *Rev. d'Ent.* viii, p. 267, n. spp.

Tachinus subterraneus n. var. *ruscolliis*; EPPELSHEIM, p. 172, *Deutsche* e. Z. 1889.

T. starcki, W. Caucasus, EPPELSHEIM, p. 12, *Wien. ent. Z.* viii, n. sp.

Conurus acutus, pulchricornis, New Caledonia, FAUVEL, *Rev. d'Ent.* viii, p. 269, n. sp.

Staphylinides.

Velleius setosus, Japan, SHARP, p. 29, *Ann. N. H.* (6) iii, n. sp.

Quedius raguere, Sicily, EPPELSHEIM, *Nat. Sicil.* viii, p. 89; *Q. praeditus*, p. 29, *abnormalis, flavicornis*, p. 30, *laticollis, hirticornis, imbecillis*, p. 31, *annectens, adustus*, p. 32, *multipunctatus*, p. 33, Japan, SHARP, *Ann. N. H.* (6) iii; *Q. (Sauridus) plagifer*, p. 15, *obliqueseriatus*, p. 17, *gemellus*, p. 18, Circassia, EPPELSHEIM, *Wien. ent. Z.* viii; *Q. (Microsaurus) seriatus*, China, EPPELSHEIM, *Hor. Ent. Ross.* xxiii, p. 169 : n. spp.

Microsaurus (eppelsheimii), in *Faun. balt.* p. 398) *pectinator*, Europe, SEIDLITZ, *Faun. trans.* p. 425, *Arten*, n. sp.

Quedionuchus planatus, concolor, armipes, Japan, SHARP, *Ann. N. H.* (6) iii, p. 34, n. spp.

Heterothops rotundiceps, Japan, SHARP, *Ann. N. H.* (6) iii, p. 35, n. sp.

Hadropinus, n. g., p. 115, for *H. fossor*, n. sp., Japan, p. 116; SHARP, *Ann. N. H.* (6) iii.

Agelorus, n. g., for *Goërius carinatus*, Shp.; SHARP, p. 110, *Ann. N. H.* (6) iii.

Micbodelus, n. g., p. 111, for *M. brevipennis*, n. sp., Japan, p. 112; SHARP, *Ann. N. H.* (6) iii.

Anisodinus, n. g., p. 113, for *A. picticornis*, p. 113, *elegans*, p. 114, n. spp., Japan ; SHARP, Ann. N. H. (6) iii.

Ocyus nigroæneus, dorsalis, p. 109, *scutiger*, p. 110, Japan, SHARP, Ann. N. H. (6) iii ; *O. (Goërius) fulvotomentosus*, p. 172, *ænescens*, p. 174, Kansu, EPPELSHEIM, Hor. Ent. Ross. xxiii : n. spp.

Staphylinus, structure of tarsal clothing ; PERO (627). *S. violareus*, structure of epipharynx ; PACKARD, Psyche, v, p. 227. *S. olens*, metamorphosis ; PISSOT, Le Nat. 1889, p. 205.

S. (Platydracus) impotens, Kansu, EPPELSHEIM, Hor. Ent. Ross. xxiii, p. 170 ; *S. griseipennis*, Moupin, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 10 ; *S. chalcæcens, vicarius*, p. 117, *daimio*, p. 118, Japan, SHARP, Ann. N. H. (6) iii : n. spp.

Cafus rufescens, Japan, SHARP, Ann. N. H. (6) ii, p. 44, n. sp.

Phucobius, note on ; SHARP, Ann. N. H. (6) iii, p. 108.

Lisus, n. g., for *Hadrotus killeri*, Weise ; SHARP, p. 116, Ann. N. H. (6) iii.

Amichrotus, n. g., p. 114, for *A. apicipennis*, n. sp., Japan, p. 115 ; SHARP, Ann. N. H. (6) iii.

Philonthus quisquiliarius, Gyll. = (*quadricollis*, Horn) ; FAUVEL, Rev. d'Ent. viii, p. 115.

P. dentipes, Spain, p. 172, *oberti*, Dauria, p. 174, EPPELSHEIM, Deutsche e. Z. 1889 ; *P. reitteri*, Circassia, EPPELSHEIM, p. 18, Wien. ent. Z. viii ; *P. bisinuatus*, Sze-tschuan, p. 175, *P. (Gefyrobis) potanini*, p. 177, *P. (Rabigus) alienus*, p. 178, Kansu, EPPELSHEIM, Hor. Ent. Ross. xxiii ; *P. bicaudus, liopterus, micanticollis*, p. 36, *depressipennis*, p. 37, *discrepens, virgatus*, p. 38, *sulcifrons*, p. 39, *inconstans*, p. 40, *cunctator, spadiceus*, p. 41, *macrocephalus, daimio*, p. 42, Japan, SHARP, Ann. N. H. (6) iii ; *P. perforatus*, N. America, FAUVEL, Rev. d'Ent. viii, p. 114 ; *P. kanalensis*, p. 264, *sanguinosus*, p. 265, New Caledonia, FAUVEL, Rev. d'Ent. viii : n. spp.

Hesperus castoides, p. 187, *laniger*, p. 188, W. Africa, FAUVEL, Notes Leyd. Mus. xi ; *H. ornatus*, Japan, SHARP, Ann. N. H. (6) iii, p. 43 : n. spp.

Actobius inornatus, Japan, SHARP, p. 43, Ann. N. H. (6) iii, n. sp.

Philetarius, n. g., p. 118, for *P. elegans*, n. sp., Japan, p. 119 ; SHARP, Ann. N. H. (6) iii.

Phytolinus, n. g., p. 119, for *P. lewisii*, n. sp., Japan, p. 121 ; SHARP, Ann. N. H. (6) iii.

Rhynchocheilus, n. g., for *R. pectoralis*, n. sp., Malacca ; SHARP, p. 120, Ann. N. H. (6) iii.

Xantholinus (Eulissus) sanguinipes, Araxes Valley, REITTER, p. 275, Deutsche e. Z. 1889 ; *X. pauper, tubulus*, p. 250, *cunctator, angusticeps*, p. 251, *punctiventris*, p. 252, Japan, SHARP, Ann. N. H. (6) iii ; *X. kanalensis*, New Caledonia, FAUVEL, Rev. d'Ent. viii, p. 261 : n. spp.

Nudobius apicipennis, Japan, SHARP, p. 253, Ann. N. H. (6) iii, n. sp.

Metoponcus fugitivus, Lord Howe I., OLLIFF, Lord Howe Island, p. 79, n. sp.

Leptacinus planulatus, Japan, SHARP, p. 252, Ann. N. H. (6) iii, n. sp.

Pæderides.

Cryptobium cuneatum, p. 253, *densipenne*, p. 254, Japan, SHARP, Ann. N. H. (6) iii; n. spp.

Homotarsus, Chaud., = (*Hesperobium*, Casey); CASEY, Ent. Am. v, p. 182.

Lathrobium pandellei, Pyrenees, CZWALINA, p. 367, pl. ii, fig. 12, Deutsche e. Z. 1889; *L. eppelsheimi*, p. 33, *reitteri*, p. 34, Circassia, CZWALINA, Wien. ent. Z. viii; *L. pollens*, p. 254, *brachypternum*, *monticola*, *carinicollis*, p. 255, *cribricollis*, *funebra*, p. 256, *cognatum*, *pallipes*, p. 257, *fragile*, *regulare*, p. 258, *seriatum*, *monilicornis*, p. 259, Japan, SHARP, Ann. N. H. (6) iii : n. spp.

Achenium quadricipes, Askhabad, EPPELSHEIM, p. 175, Deutsche e. Z. 1889, n. sp.

Domene daimio, *orbiculata*, p. 260, *curtipennis*, p. 261, Japan, SHARP, Ann. N. H. (6) iii, n. spp.

Scopæus basicornis, Shp., referred to *Thinocharis*; SHARP, p. 263, Ann. N. H. (6) iii.

S. currae, Japan, SHARP, p. 261, Ann. N. H. (6) iii; *S. unifasciatus*, New Caledonia, FAUVEL, Rev. d'Ent. viii, p. 255 : n. spp.

Paniscopæus, n. g., for *Scopæus lithocharoides*, Shp.; SHARP, p. 262, Ann. N. H. (6) iii.

Charichirus, n. g., for *Lithocharis spectabilis*, Kr.; SHARP, Ann. N. H. (6) iii, p. 262.

Isochailus, n. g., for *Lithocharis staphylinoides*, Kr.; SHARP, p. 263, Ann. N. H. (6) iii.

Stilicoderus, n. g., p. 320, for *S. signatus*, n. sp., Japan, p. 321; SHARP, Ann. N. H. (6) iii.

Platymedon, n. g., for *P. laticollis*, n. sp., Nebraska; CASEY, Ent. Am. v, p. 184.

Megastilicus, n. g., for *M. formicarius*, n. sp., Massachusetts; CASEY, Ent. Am. v, p. 183.

Eomedon, n. g., p. 319, for *E. hirtellus*, n. sp., Japan, p. 320; SHARP, Ann. N. H. (6) iii.

Medon sparsiventris, Lenkoran, p. 176, *cephalicus*, Feodosia, p. 177, EPPELSHEIM, Deutsche e. Z. 1889; *M. rubeculus*, p. 264, *confertus*, *spadicus*, p. 265, *discedens*, *submaculatus*, p. 266, Japan, SHARP, Ann. N. H. (6) iii; *M. kanak*, New Caledonia, FAUVEL, Rev. d'Ent. viii, p. 256 : n. spp.

Lithocharis nigrigula, Er., = (*sicula*, Kr.), with n. var. *micropepla*; KRAATZ, p. 220, Deutsche e. Z. 1889.

Stilicus longipennis, Japan, SHARP, p. 321, Ann. N. H. (6) iii, n. sp.

Sunius porosus, Japan, SHARP, p. 322, Ann. N. H. (6) iii, n. sp.

Astennus capitalis, p. 254, *reticollis*, p. 255, New Caledonia, FAUVEL, Rev. d'Ent. viii, n. spp.

Mesunius optatus, Japan, SHARP, p. 322, Ann. N. H. (6) iii, n. sp.

Stamnoderus delauneyi, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 380, pl. vii, fig. 7, n. sp.

Pæderus: figures of the forceps of numerous European species;

CZWARLINA, p. 368, pl. ii, figs. 1-11, Deutsche e. Z. 1889. The European species tabulated; REITTER, Ent. Nachr. xv, pp. 169-171.

P. syriacus, Syria, REITTER, p. 170, Ent. Nachr. xv; *P. mesopotamicus*, Asia Minor, EPPELSHEIM, p. 178, Deutsche e. Z. 1889; *P. agnatus*, Kansu, EPPELSHEIM, Hor. Ent. Ross. xxiii, p. 180 : n. spp.

Pinophilides, *Evæsthetides*, *Stenides*.

Pinophilus punctatissimus, Japan, SHARP, p. 323, Ann. N. H. (6) iii, n. sp.

Procirrus lewisii, Japan, *fuscus*, Dacca, SHARP, p. 324, Ann. N. H. (6) iii, n. spp.

Edichirus simoni, Syria, EPPELSHEIM, p. 179, Deutsche e. Z. 1889; *Æ. sedilloti*, New Caledonia, FAUVEL, Rev. d'Ent. viii, p. 254 : n. spp.

Edaphus japonicus, Nagasaki, SHARP, p. 325, Ann. N. H. (6) iii, n. sp.

Stenus lineola, Circassia, EPPELSHEIM, p. 20, Wien. ent. Z. viii; *S. semenowi*, p. 181, *mongolicus*, p. 183, Kansu, EPPELSHEIM, Hor. Ent. Ross. xxiii; *S. anthracinus*, *lentus*, p. 326, *distans*, *laborator*, p. 327, *hirtiventris*, *bicolor*, p. 328, *palpalis*, *latitarsis*, p. 329, *mysticus*, *indubius*, p. 330, *cephalotes*, *confertus*, p. 331, *concinus*, p. 332, *mercator*, *sedatus*, *velox*, p. 333, *flavidulus*, p. 334, Japan, SHARP, Ann. N. H. (6) iii; *S. planifrons*, New Caledonia, Celebes, FAUVEL, Rev. d'Ent. viii, p. 253 : n. spp.

Oxytelides, &c.

Oxyporus maxillosus n. var. *apicalis*; EPPELSHEIM, p. 181, Deutsche e. Z. 1889.

O. niger, *triangulum*, *japonicus*, p. 407, *maculiventris*, *parvus*, p. 408, *germanus*, *longipes*, p. 409, *humeralis*, *hoplites*, *gnatho*, p. 410, *biguttatus*, p. 411, Japan, SHARP, Ann. N. H. (6) iii, n. spp.

Osorius strigifrons, W. Africa, KOLBE, S. E. Z. I, p. 122; *O. fumator*, New Caledonia, FAUVEL, Rev. d'Ent. viii, p. 246; *O. taurus*, p. 411, *microps*, p. 412, Japan, SHARP, Ann. N. H. (6) iii : n. spp.

Holotrochus caledoniæ, New Caledonia, FAUVEL, Rev. d'Ent. viii, p. 245, n. sp.

Bledius : revision of the N. American species; CASEY, Ann. N. York Ac. v, pp. 41-71. *B. phytosinus*, Lec., = (*lecontei*, Duv.); CASEY, Ann. N. York Ac. v, p. 71. *B. erythropterus*, Kr. is a monstrosity of *B. fracticornis*; KRAATZ, p. 220, Deutsche e. Z. 1889.

B. heterocerus, Croatia, EPPELSHEIM, p. 180, Deutsche e. Z. 1889; *B. curricornis*, p. 412, *obtusus*, *cribratus*, *sellatus*, p. 413, Japan, SHARP, Ann. N. H. (6) iii; *B. strenuus*, p. 44, *furtivus*, p. 45, *monstratus*, p. 46, *eximius*, p. 47, *agonus*, *ineptus*, p. 48, *lectus*, p. 49, *tenuis*, p. 50, *turgidus*, p. 52, *foraminosus*, p. 53, *gravidus*, p. 54, *assimilis*, p. 55, *villosus*, *nebulosus*, p. 57, *monticola*, p. 58, *gentilis*, p. 59, *gracilis*, p. 60, *stabilis*, p. 61, *adustus*, p. 62, *languidus*, p. 63, *bicolor*, p. 64, *parvicollis*, p. 65, *honestus*, p. 66, *ignavus*, p. 67, *misellus*, p. 68, *neglectus*, p. 69, *turbulentus*, p. 70, N. America, CASEY, Ann. N. York Ac. v; *B. circularis*, p. 251, *fossiventris*, p. 252, New Caledonia, FAUVEL, Rev. d'Ent. viii : n. spp.

Coprophilus impressus, *simplex*, Japan, SHARP, p. 415, Ann. N. H. (6) iii, n. spp.

Oxytelus flavipennis, Tripolia, EPPELSHEIM, B. E. Z. xxxiii, p. 313; *O. gregarius*, Japan, SHARP, p. 414, Ann. N. H. (6) iii; *O. antennalis*, *picticornis*, p. 249, *coriaceus*, p. 250, New Caledonia, FAUVEL, Rev. d'Ent. viii : n. spp.

Aploderus cephalotes, p. 74, *princeps*, p. 75, *flavipennis*, p. 76, N. America, CASEY, Ann. N. York Ac. v, n. spp.

Trogophleus: monograph of the N. American species; CASEY, Ann. N. York Ac. iv, pp. 322-383. *T. quadripunctatus*, Say, = (*Haploderus laticollis*, Lec.); CASEY, p. 341, t. c.

T. sericatus, p. 415, *eminens*, *deceptor*, p. 416, *vagus*, *sedatus*, p. 417, Japan, SHARP, Ann. N. H. (6) iii; *T. duplex*, New Caledonia, FAUVEL, Rev. d'Ent. viii, p. 248; *T. anthracinus*, p. 330, *corvinus*, p. 331, *dentiger*, N. America, *mexicanus*, Guanajuato, p. 333, *texanus*, p. 334, *armatus*, *gila*, p. 335, *prominens*, p. 336, *pacificus*, p. 337, *arizonæ*, p. 338, *occidentis*, p. 339, *conjunctus*, p. 342, *spretus*, p. 343, *apacheanus*, p. 344, *manus*, *spectatus*, p. 345, *imbellis*, p. 346, *lepidus*, p. 347, *diffusus*, *lupsus*, p. 350, *egregius*, p. 352, *obliquus*, p. 353, *sculptilis*, *difficilis*, p. 354, *congener*, p. 355, *agonus*, p. 356, *temporalis*, p. 357, *probus*, *nanulus*, p. 358, *modestus*, p. 359, *pertenuis*, p. 360, *detractus*, p. 361, *indigenus*, *graphicus*, p. 362, *ingens*, p. 363, *incertus*, p. 364, *delicatus*, p. 365, *pudicus*, p. 368, *robustus*, *confinis*, p. 369, *pauperculus*, p. 370, *languidus*, p. 371, *bipuncticollis*, p. 372, *pallidulus*, p. 373, *debilis*, p. 374, *bledianus*, *fallax*, p. 375, *providus*, p. 376, *inquisitus*, p. 377, *facetus*, *confusus*, p. 378, *scrupulus*, p. 379, *insolitus*, p. 380, *filum*, p. 381, *decoloratus*, p. 382, *tantillus*, p. 383, N. America, CASEY, Ann. N. York Ac. iv : n. spp.

Thinobius, monograph of the N. American species; CASEY, Ann. N. Ac. v, pp. 78-89 : characters of the European species; FAUVEL, Rev. d'Ent. viii, pp. 83-89.

T. angusticeps, Britain and Chamounix, p. 84, *diversicornis*, France, p. 86, *heterogaster*, Europe, p. 87, FAUVEL, Rev. d'Ent. viii; *T. pallidicornis*, p. 80, *grossulus*, p. 81, *sonomæ*, p. 83, *hesperius*, p. 84, *pygmaeus*, p. 85, *pallidus*, p. 86, *gracilicornis*, *crassicornis*, p. 87, *validus*, p. 88, CASEY, Ann. N. York Ac. v : n. spp.

Derops, n. g., for *D. longicornis*, n. sp., Japan; SHARP, p. 418, Ann. N. H. (6) iii.

Megorthrus carticalia, p. 468, *scriptus*, p. 469, Japan, SHARP, Ann. N. H. (6) iii, n. spp.

Siagonium nobile, p. 463, *debile*, *gracile*, p. 464, Japan, SHARP, Ann. N. H. (6) iii, n. spp.

Plectoneus, n. g., p. 464, for *P. lewisii*, n. sp., Japan, p. 465; SHARP, Ann. N. H. (6) iii.

Thoracopharus certatus, Japan, SHARP, p. 465, Ann. N. H. (6) iii; *T. brevipennis*, New Caledonia, FAUVEL, Rev. d'Ent. viii, p. 244 : n. spp.

Nodynus, Waterh., to be placed in *Triganurini*; SHARP, p. 467, Ann. N. H. (6) iii.

Lispinus aper, Japan, SHARP, p. 466, Ann. N. H. (6) iii, n. sp.

Eleusis courceta, p. 466, *subtilis*, p. 467, Japan, SHARP, Ann. N. H. (6) iii; *E. brevipennis*, New Caledonia, p. 242, *virgula*, New Zealand, p. 243, FAUVEL, Rev. d'Ent. viii : n. spp.

Leptochirus davidis, Moupin, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 11, n. sp.

Priochirus japonicus, Japan, SHARP, p. 468, Ann. N. H. (6) iii, n. sp.

Olophrum vicinum, Japan, SHARP, p. 472, Ann. N. H. (6) iii, n. sp.

Trigonodemus, Mann., = (*Arimimelus*, Kr.); SHARP, p. 473, Ann. N. H. (6) iii.

Lestera crassipes, p. 471, *plagiata*, p. 472, Japan, SHARP, Ann. N. H. (6) iii, n. spp.

Amphichroum debile, Japan, SHARP, Ann. N. H. (6) iii, p. 472, n. sp.

Anthophagus bicornis, n. varr. *marginicollis* and *nigrinus*; EPPELSHEIM, p. 181, Deutsche e. Z. 1889.

A. aquatilis, p. 469, *sinuatus*, *caliginosus*, *lestevoides*, p. 470, *subtilis*, p. 471, Japan, SHARP, Ann. N. H. (6) iii, n. spp.

Homalium falsum, Caucasus, EPPELSHEIM, p. 21, Wien. ent. Z. viii; *H. lacrymale*, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 381, pl. vii, fig. 8; *Omalius curtellum*, p. 473, *nipponense*, *diffine*, p. 474, *daimio*, *denticolle*, p. 475, Japan, SHARP, Ann. N. H. (6) iii; *H. (Phyllo-drepa) curticolle*, p. 182, *asperum*, p. 183, Syria, EPPELSHEIM, Deutsche e. Z. 1889: n. spp.

Anthobium pollens, *parallelum*, Japan, SHARP, p. 476, Ann. N. H. (6) iii, n. spp.

PSELAPHIDÆ.

[Cf. BRENDEN (99), REITTER (672, 681, 692, 700), SCHAUFUSS (762), XAMBEU (943, 945).]

Chennium bituberculatum, larva described; XAMBEU, Rev. d'Ent. viii, p. 332.

Bythinus bauduieri = (*latebrosus* and *blandus*, Reitt.); CROISSANDEAU, Rev. d'Ent. viii, p. 12.

Pselaptrichus, n. g., for *P. tuberculipalpus*, n. sp., California; BRENDEN, Ent. Am. v, p. 194.

Batriscus (Arthmius) cristatifrons, p. 3, *cristulatus*, p. 4, Brazil, REITTER, Notes Leyd. Mus. xi; *B. (Batrisodes) pruinosis*, China, REITTER, Hor. Ent. Ross. xxiii, p. 558: n. spp.

Bryaxis aracidis, Araxes Valley, REITTER, p. 19, Deutsche e. Z. 1889, n. sp.

Rybaxis carangula, Valdivia, REITTER, p. 292, pl. iv, fig. 5, Wien. ent. Z. viii, n. sp.

Euplectus, distinctions between it and *Trimium* discussed; BRENDEN, Ent. Am. v, p. 196.

E. guillebeaui, East Pyrenees, XAMBEU, Rev. d'Ent. viii, p. 239; *E. planipennis*, Iowa, BRENDEN, Ent. Am. v, p. 195: n. spp.

Trimium thoracicum, Iowa, BRENDEN, Ent. Am. v, p. 197, n. sp.

Cyathiger juvenis, Sumatra, REITTER, p. 4, Notes Leyd. Mus. xi, n. sp.

Hybocephalus clavatus, Sumatra, REITTER, p. 5, Notes Leyd. Mus. xi, n. sp.

Articerus californicus, Los Angeles, BRENDEN, Ent. Am. v, p. 197, n. sp.

SCYDMENIDÆ.

[*Cf.* BRENDÉL (99), FAUVEL (259, 260), REITTER (672), SCHAUFUSS (761), XAMBEU (943).]

Glaphostoma, n. g., p. 2, for *G. cribricolle*, Zanzibar, n. sp., p. 21; SCHAUFUSS, B. E. Z. xxxiii.

Horzomorphus, n. g., for *H. eumicroides*, n. sp., Singapore; SCHAUFUSS, p. 21, B. E. Z. xxxiii.

Syndicus peninsularis, Singapore, SCHAUFUSS, p. 22, B. E. Z. xxxiii, n. sp.

Glandularia fricatoris, p. 23, *erichsoni*, Singapore, *subplicata*, Zanzibar, p. 24, *quadrifoveolata*, *appendiculata*, p. 25, *interrupta*, p. 26, Singapore, *incertus*, Zanzibar, p. 27, SCHAUFUSS, B. E. Z. xxxiii, n. spp.

Brachycephis, n. g., for *B. fuchsii*, n. sp., California; BRENDÉL, Ent. Am. v, p. 193.

Eumicrus giganteus, *atrorufus*, New Caledonia, FAUVEL, Rev. d'Ent. viii, p. 284, n. spp.

Scydmanus and *Eumicrus*, note on the application of these names; REITTER, pp. 264-266, Deutsche e. Z. 1889.

Scydmanus (?) *minimus*, Iowa, BRENDÉL, Ent. Am. v, p. 193; *S. gloriosus*, p. 32, *scutellatus*, p. 33, *blandus*, p. 34, *vilis*, *nitidus*, p. 35, *efflorescens*, *separatus*, p. 36, Zanzibar, *excavatus*, Aden, *hyalinus*, p. 37, *delectus*, p. 38, Zanzibar, *similis*, Singapore, *coaxalis*, Zanzibar, p. 39, *extensionis*, Singapore, *geniculatus*, Aden, p. 40, *regularis*, *aurifer*, p. 41, *diverseipilosus*, p. 42, Singapore, SCHAUFUSS, B. E. Z. xxxiii : n. spp.

Cyrtoscydmus *kamberskyi*, Araxes Valley, *achillei*, Algeria, REITTER, p. 20, Deutsche e. Z. 1889; *C. femineus*, p. 3, *timendus*, p. 4, *regulus*, Singapore, *pumilio*, p. 5, *immersionis*, p. 6, *designatus*, Zanzibar, p. 7, *pudicus*, Singapore, p. 6, *scopulatus*, Aden, p. 7, *diverseimpressus*, p. 8, *refertus*, *scopulifer*, p. 9, *calvescens*, p. 10, Zanzibar, *centurionis*, *vittatus*, p. 11, *concinatus*, *ocularis*, p. 12, *laborator*, p. 13, *glandifer*, Singapore, *bagamoyensis*, Zanzibar, p. 14, *rubiginosus*, Aden, p. 15, *conifer*, Singapore, *quadripunctatus*, p. 16, *bioculatus*, p. 17, *uliginosus*, *incongruens*, p. 18, *lævigatus*, *sultanus*, p. 19, Zanzibar, *capillaris*, Singapore, p. 20, SCHAUFUSS, B. E. Z. xxxiii : n. spp.

Euconnus pyreneus, Ria, XAMBEU, Rev. d'Ent. viii, p. 241; *E. crinitus*, New Caledonia, FAUVEL, Rev. d'Ent. viii, p. 283 : n. spp.

Neuraphes conifer, Auvergne, FAUVEL, Rev. d'Ent. viii, p. 238; *N. ludyi*, Carinthia, REITTER, p. 275, Deutsche e. Z. 1889 : n. spp.

Cephenium anophthalmicum, California, BRENDÉL, Ent. Am. v, p. 194; *C. festicum*, Singapore, p. 27, *zanzibaricum*, Zanzibar, p. 28, *raffrayi*, Singapore, p. 29, SCHAUFUSS, B. E. Z. xxxiii : n. spp.

Alaudula, n. g., for *A. rectispina*, Aden, p. 31, *prudentis*, Zanzibar, p. 32, n. spp.; SCHAUFUSS, B. E. Z. xxxiii.

SILPHIDÆ.

[*Cf.* OLLIFF (612), PACKARD (619), REITTER (674, 680, 684), XAMBEU (945).]

Discussion of the characters and classification of Cave *Silphidæ*; REITTER, Deutsche e. Z. 1889, pp. 289-301.

Necrophorus, structure of tarsal clothing; PERO (627).

Necrophorus stenophthalmus, Jak., redescribed; REITTER, p. 276, Deutsche e. Z. 1889.

Silpha and *Necrodes*, structure of tarsal clothing; PERO (627). & *sinuata*, Fab., metamorphoses; XAMBEU, Rev. d'Ent. viii, pp. 272-274.

Parasilpha obscura, L., n. var. *corax*; REITTER, p. 255, Deutsche e. Z. 1889.

Nodynus, referred to *Trigonurini* in *Staphylinidæ*; SHARP, p. 467, Ann. N. H. (6) iii.

Catapomorphus pilosus, Muls., larva described; XAMBEU, Rev. d'Ent. viii, p. 333.

C. antoniae, Ordubad, REITTER, p. 371, Deutsche e. Z. 1889, n. sp.

Attumbru subnula, Ordubad, REITTER, p. 371, Deutsche e. Z. 1889, n. sp.

Choleva cisteloides, *elongata*, *sturmii*, synonymy discussed; SEIDLITZ, pp. 150-152, Deutsche e. Z. 1889.

Adelops hirtus, larva and pupa described and figured; PACKARD, Mem. Nat. Ac. Sci. iv, pp. 78 & 79, pls. xix, fig. 4, & xx, figs. 8 & 9.

Drimeotus ormayi, Bedelo, REITTER, Deutsche e. Z. 1889, p. 301, n. sp.

Protobracharthron, n. g., for *Hexaurus reitteri*, Apf.; REITTER, p. 297, Deutsche e. Z. 1889.

Apholeuonus, n. g., for *Hexaurus nudus*, Apf.; REITTER, p. 297, Deutsche e. Z. 1889.

Anisotoma tasmaniae, Tasmania, OLLIFF, p. 1513, P. Linn. Soc. N.S.W. (2) iii; *Liodes angulicollis*, Bavaria, REITTER, p. 111, Deutsche e. Z. 1889; n. sp.

Agathidium pallidum noticed; CROISSANDEAU, Bull. Soc. Ent. Fr. (6) ix, p. cxvi.

TRICHOPTERYGIDÆ, HYDROSCAPHIDÆ, SCAPHIDIIDÆ.

[Cf. FLACH (267, 268, 269), MATTHEWS (558), REITTER (681).]

Characters and classification of the European *Trichopterygidæ*; FLACH (268).

Winged and apterous, seeing and blind forms, note on; FLACH (267).

Ptenidium penzigi, Asia Minor, *turgidulum*, Caucasus, p. 496, FLACH, Verh. z.-b. Wien, xxxix; *P. caseianum*, California, *attenuatum*, Italy, *africanum*, Algeria, p. 194, *obscutatum*, Morea, *incognitum*, England, p. 195, MATTHEWS, Ann. N. H. (6) iii: n. spp.

Ptenidium (sic) *turgidulum*, Caucasus, *penzigi*, Asia Minor, FLACH, Soc. Ent. iv, p. 1, n. spp.

Matthewsium, n. subg. of *Ptenidium*; FLACH, Verh. z.-b. Wien, xxxix, p. 494.

Gillmeisterium, n. subg. of *Ptenidium*; FLACH, Verh. z.-b. Wien, xxxix, p. 498.

Actidium sharpianum, note on; FLACH, Verh. z.-b. Wien, xxxix, p. 501.

A. kraatzi, Hyères, FLACH, p. 500, Verh. z.-b. Wien, xxxix ; *A. reitteri*, Hyères, FLACH, Soc. Ent. iv, p. 1 : n. spp.

Ptilium rezans, Corsica, FLACH, Soc. Ent. iv, p. 1, and Verh. z.-b. Wien, xxxix, p. 504, n. sp.

Oligella, n. g., for *Ptilium foveolatum*, Al. ; FLACH, Verh. z.-b. Wien, xxxix, p. 501.

Ptiliolium, n. g., for a part of *Ptilium*, FLACH, Verh. z.-b. Wien, xxxix, p. 506.

Nanoptilium, p. 506, *Trichoptilium*, p. 507, *Euptilium*, p. 508, *Typhloptilium*, p. 509, n. subgg. of *Ptiliolium* ; FLACH, Verh. z.-b. Wien, xxxix.

Mikado, n. g., for *M. japonicus*, n. sp., Higo ; MATTHEWS, p. 189, Ann. N. H. (6) iii.

Dimorphella, n. g., for *D. reitteri*, n. sp., Blumenau ; MATTHEWS, p. 190, Ann. N. H. (6) iii.

Ptinella brasiliانا, Blumenau, MATTHEWS, p. 191, Ann. N. H. (6) iii, n. sp.

Trichopteryx caucasica, *soror*, Caucasus, FLACH, Soc. Ent. iv, p. 2, and Verh. z.-b. Wien, xxxix, p. 520 ; *T. caucasica*, Caucasus, *hellenica*, Morea, p. 191, *truncatissima*, *brasiliensis*, Blumenau, *angusta*, England, p. 192, *reticulata*, *darwinii*, Brazil, *tesserula*, N. America, p. 193, MATTHEWS, Ann. N. H. (6) iii : n. spp.

Ctenopteryx, n. subg. of *Trichopteryx* ; FLACH, Verh. z.-b. Wien, xxxix, p. 517.

Hydroscaphidæ : characters of the family, p. 523 ; *H. sharpi* figured, pl. xiii, fig. 6 ; FLACH, Verh. z.-b. Wien, xxxix.

Bæoceridium, n. g. (*Scaphidiidæ*), for *B. depressipes*, n. sp., W. Africa ; REITTER, p. 6, Notes Leyd. Mus. xi.

Scaphidium picconii n. var. *sexmaculatum* ; REITTER, p. 7, Notes Leyd. Mus. xi.

HISTERIDÆ.

[(*C.* KIRSCH (455), LEWIS (510, 511, 515), MARSEUL (549), RICHTER (711), SCHMIDT (775, 776, 777, 778, 779, 780)]

Notes on myrmecophilous *Histeridæ* at Gibraltar ; WALKER (890).

Lioderma, characters discussed ; SCHMIDT, Ent. Nachr. xv, p. 72.

Hololepta insignis, W. Africa, SCHMIDT, Ent. Nachr. xv, p. 71 ; *H. immarginata*, Dorey, *strigilata*, W. Africa, SCHMIDT, Ent. Nachr. xv, p. 329 : n. spp.

Phylloma exutum, Ecuador, LEWIS, Ann. N. H. (6) iii, p. 277, n. sp.

Platysoma insulicola, Fiji, *malaicum*, Borneo, p. 331, *oberndorferi*, Java, *sunde*, Borneo, p. 332, *decipiens*, Ceylon, *breve*, Malacca, p. 333, *difficile*, Philippines, *integrum*, E. India, p. 334, *richteri*, Madagascar, p. 335, SCHMIDT, Ent. Nachr. xv ; *P. palmipes*, Sumatra, *gorhami*, p. 278, *balilolum*, Zanzibar, *delicatum*, Brazil, p. 279, *scitulum*, Borneo, p. 280, LEWIS, Ann. N. H. (6) iii : n. spp.

Placodes intermedius, Ashantee, SCHMIDT, Ent. Nachr. xv, p. 330, n. sp.

Pachycrævus modestus, Zanzibar, LEWIS, p. 281, Ann. N. H. (6) iii : *P.*

diversicollis, *congonis*, W. Africa, SCHMIDT, Ent. Nachr. xv, p. 336 : n. spp.

Calocnara nitida, Lew., referred to *Phelister* ; LEWIS, p. 282, Ann. N. H. (6) iii.

Discocelis, n. g., p. 318, for *D. canaliculata*, n. sp., Paraguay, p. 319 ; SCHMIDT, B. E. Z. xxxiii.

Colonides, n. g., for *C. drakei*, n. sp., Paraguay ; SCHMIDT, p. 320, B. E. Z. xxxiii.

Phelister and *Baconia*, note on characters of ; SCHMIDT, p. 158, Deutsche e. Z. 1889.

P. terminalis, *nickerli*, p. 155, *divergens*, p. 156, *truncatus*, p. 157, Africa, SCHMIDT, Deutsche e. Z. 1889 ; *P. simoni*, Venezuela, LEWIS, Ann. N. H. (6) iv, p. 46 ; *P. (Baconia) fulgidus*, Paraguay, SCHMIDT, B. E. Z. xxxiii, p. 324 ; *P. (B.) micans*, Brazil, p. 336, *P. subdepressus*, Colombia, p. 337, *thiemei*, Matto Grosso, *nanus*, Paraguay, p. 338, *gibbulus*, Colombia, p. 339, *gracilis*, Venezuela, p. 340, SCHMIDT, Ent. Nachr. xv ; *P. dubitabilis*, Amazonas, p. cxxvi, *impar*, Zanzibar, *egincola*, Amazonas, p. cxxvii, *interrogans*, Brazil, p. cxxxviii, *canalis*, Panama, *trigonisternus*, S. America, p. cxxxix, *uncistrius*, Guatemala, *rubicundus*, S. America, p. cxlvi, *bides-soia*, Brazil, p. cxlvii, MARSEUL, Bull. Soc. Ent. Fr. (6) ix : n. spp.

Rhyphochures fallax, p. 340, *asper*, p. 361, C. Good Hope, SCHMIDT, Ent. Nachr. xv, n. spp.

Omalodes marseuli, Brazil, SCHMIDT, p. 159, Deutsche e. Z. 1889 ; *O. tuberculipygus*, Amazonas, p. 361, *humerosus*, Medellin (Mexico) (sic), p. 362, *areolatus*, p. 363, *seriatus*, p. 364, Brazil, SCHMIDT, Ent. Nachr. xv : n. spp.

Contipus flexuosus, Matabele land, *abhorrens*, S. Brazil, SCHMIDT, Ent. Nachr. xv, p. 365, n. spp.

Campylorhabdus, n. g., p. 366, for *C. singularis*, n. sp., Zanzibar, p. 367, and *Tinotarsus poggei*, Har. ; SCHMIDT, Ent. Nachr. xv.

Hister leseleuci, note on its synonymy ; MARSEUL, p. 46, Notes Leyd. Mus. xi. *H. memnonius*, Er., = (*arabicus*, Mars.) ; *squalidus*, Er., = (*mandarinus*, Mars.) ; SCHMIDT, p. 160, Deutsche e. Z. 1889.

H. koltzei, Wladiwostok, SCHMIDT, Ent. Nachr. xv, p. 369 ; *H. holubi*, S. Africa, SCHMIDT, p. 153, Deutsche e. Z. 1889 ; *H. africanus*, E. Africa, *ulcipygus*, Mombas, p. 282, *circularis*, Senegal, *pyxidatus*, Abyssinia, p. 283, *tenuistriatus*, Borneo, p. 284, LEWIS, Ann. N. H. (6) iii ; *H. simulans*, Zanzibar, p. 85, *fortis*, Nyassa, *conilabris*, Caffraria, p. 86, *mandibularis*, Celebes, p. 87, *gorilla*, Ashantee, *paganus*, Somali, p. 88, *obtusisternus*, Zanzibar, *opacus*, E. India, p. 89, *pharaonis*, Egypt, *scabripygus*, Zanzibar, p. 90, *pilicollis*, C. Good Hope, p. 91, *peregrinus*, E. Africa, *aschanti*, *circulus*, W. Africa, p. 92, *infirmus*, p. 93, *multidens*, E. India, *materreri*, C. Good Hope, p. 94, *staudingeri*, Congo, p. 95, *cochinchinos*, Saigon, p. 96, SCHMIDT, Ent. Nachr. xv : n. spp.

Triballus californicus, Horn, referred to *Stictostix* ; LEWIS, p. 284, Ann. N. H. (6) iii.

T. catenarius, Pulo Batu, LEWIS, p. 285, Ann. N. H. (6) iii, n. sp.

Eblisia, n. g., for *E. convexa*, n. sp., Borneo ; LEWIS, p. 280, Ann. N. H. (6) iii.

Carcinops geminata, Lec., = (*curraz*, Mars.); it and *C. radula*, *gagliettii*, Mara., *conjuncta*, Say, *multistriatus*, Lew., *punctinotus*, Lew., referred to *Xestipyge*, Mars.; LEWIS, p. 284, Ann. N. H. (6) iii.

U. ovatula, Blumenau, LEWIS, p. 285, Ann. N. H. (6) iii, n. sp.

Reninus, n. n., to replace *Renia*, Lew.; LEWIS, p. 275, Ann. N. H. (6) iv.

Epiurus rufulus, note on its generic status; LEWIS, Ann. N. H. (6) iii, p. 281.

E. peruanus, Peru, *insularis*, Andaman Is., p. 370, *humeralis*, Amazons, *vandepolli*, Blumenau, p. 371, *kraatzii*, Amazons, p. 372, SCHMIDT, Ent. Nachr. xv, n. spp.

Saprinus aterrimus, Er., characters of ♀; LEWIS, p. 286, Ann. N. H. (6) iii.

S. colombicus, S. America, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 3; *S. teretrioides*, Zambesi, SCHMIDT, p. 154, Deutsche z. Z. 1889; *S. schmidtii*, Niger river, RICHTER, Ent. Nachr. xv, p. 124 : n. spp.

Teretrius basalis, Australia, LEWIS, p. 286, Ann. N. H. (6) iii, n. sp.
Teretriosoma cyaneum, Brazil, LEWIS, p. 287, Ann. N. H. (6) iii; *T. horni*, Florida, LEWIS, Ent. M. M. xxv, p. 397 : n. spp.

Hesperodromus, n. g., p. 317, for *H. sodalis*, n. sp., Paraguay, p. 316; SCHMIDT, B. E. Z. xxxiii.

Sternocalis sedilloti, Algeria, LEWIS, p. 286, Ann. N. H. (6) iii, n. sp.

Termitovenus, n. g., near *Homalopygus*, for *T. setaceus*, n. sp., Paraguay; SCHMIDT, p. 321, B. E. Z. xxxiii.

Homalopygus ? *cavernosus*, Paraguay, SCHMIDT, p. 322, B. E. Z. xxxiii, n. sp.

Idolia integra, Venezuela, LEWIS, Ann. N. H. (6) iv, p. 47, n. sp.

PHALACRIDÆ.

[Cf. CASEY (138), FLACH (271, 272, 273), GOZIS (327), SHARP (324), TOURNIER (861).]

Table of the known genera, and monograph of the N. American species; CASEY, Ann. N. York Ac. v, pp. 89-143.

Monograph of the European and Mediterranean species; TOURNIER (861).

Tolyphus simoni, Syria, FLACH, Soc. Ent. iii, p. 187, n. sp.

Phalacrus = (*Augasmus*, Motsch.); TOURNIER, L'Ent. Gen. i, p. 5.

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Phalacropsis, n. g., for *Phalacrus dispar*, Lec.; CASEY, Ann. N. York Ac. v, p. 101.

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Olibrus bisignatus, Men., var. = (*coccinella*, Flach); FLACH, p. 270, Deutsche e. Z. 1889.

O. freyi, Hungary, p. 97, *similis*, Egypt, p. 98, *singularis*, S. Europe, p. 100, *delicatulus*, Sarepta, p. 121, *syriacus*, Syria, p. 122, TOURNIER, L'Ent. Gen. i; *O. metallescens*, Siberia, *koltzii*, Caucasus, *baudneri*, *demaisioni*, *baudii*, S. Europe, *heydeni*, *seidlitzii*, S. Russia, *gerhardti*, Silesia, *stierlini*, *coccinella*, S. Europe, FLACH, p. 187, Soc. Ent. iii; *O. lecontei*, p. 103, *neglectus*, p. 108, *wickhami*, p. 109, N. America, CASEY, Ann. N. York Ac. v : n. spp.

Olibroporus, n. g., for *O. punctatus*, n. sp., Florida; CASEY, p. 111, Ann. N. York Ac. v.

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Litolibrus, characters of, p. 113, *uniformis*, Texas, CASEY, Ann. N. York Ac. v, p. 115, n. sp.

Acyломus calcaratus, p. 117, *extricatus*, p. 118, *ergoti*, p. 119, *piceus*, p. 120, *nebulosus*, p. 121, N. America, CASEY, Ann. N. York Ac. v, n. spp.

Eulitrus, n. g., p. 257, for *E. estriatus*, Nicaragua, pl. vii, fig. 23, *anisotomus*, Brit. Honduras, n. spp., p. 258; SHARP, Biol. Centr. Am. Col. ii (1) [cf. also CASEY, Ann. N. York Ac. v, p. 112].

Stilbus reitteri, *polygramma*, Syria, FLACH, p. 187, Soc. Ent. iii; *S. avunculus*, Japan, FLACH, p. 272, Deutsche e. Z. 1889; *S. viduus*, p. 126, *pallidus*, p. 127, *floridanus*, p. 129, *obscurus*, p. 130, *nanulus*, p. 131, *modestus*, *subalutaceus*, p. 133, *convergens*, p. 134, *attenuatus*, p. 135, *elongatulus*, p. 136, N. America, CASEY, Ann. N. York Ac. v : n. spp.

Pseudolibrus, n. g., p. 269, for *P. gestroi*, n. sp., Abyssinia, p. 270; FLACH, Deutsche e. Z. 1889.

Litochrus defined; CASEY, Ann. N. York Ac. v, p. 137.

L. coronatus, Japan, FLACH, p. 271, Deutsche e. Z. 1889; *L. crucigerus*, p. 138, *immaculatus*, p. 139, *aterrimus*, p. 140, N. America, CASEY, Ann. N. York Ac. v; *L. globulus*, Panama, pl. viii, fig. 4, *reversus*, Guatemala, p. 263, SHARP, Biol. Centr. Am. Col. ii (1) : n. spp.

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Ochrolitus, n. g., for *O. optatus*, n. sp., Costa Rica, pl. viii, fig. 5; SHARP, Biol. Centr. Am. Col. ii (1).

O. tristriatus, Florida, CASEY, Ann. N. York Ac. v, p. 142, n. sp.

NITIDULIDÆ.

[Cf. FAIRMAIRE (236), REITTER (700), SHARP (324).]

Priops mexicanus, Reitter, referred to *Mystrops*, p. 266, figured pl. viii, figs. 7 & 8; SHARP, Biol. Centr. Am. Col. ii (1).

Mystrops rotundulus, Panama, pl. viii, fig. 9, *trapensis*, fig. 10, Mexico, p. 267,

heterocerus, Guatemala, fig. 6, p. 268, SHARP, Biol. Centr. Am. Col. ii (1), n. spp.

Oychropiestus corvinus, figured, pl. viii, fig. 11; Biol. Centr. Am. Col. ii (1).

Colastus posticus, fig. 12, *simplex*, fig. 15, figured pl. viii; *C. latus*, Murr. = (*major*, Reitt.), p. 270; *C. macropterus* n. var. *sordidus*, p. 271; *C. simplex*, Murr., = (*brevicollis*, Murr.), p. 275: SHARP, Biol. Centr. Am. Col. ii (1).

C. guatemalensis, Guatemala, p. 269, *mimetes*, Panama, pl. viii, fig. 13, p. 270, *brevipes*, Centr. America, p. 271, *inflatipennis*, Panama, pl. viii, fig. 18, *vestitus*, Centr. and S. America, p. 272, *mollis*, *laticollis*, p. 273, *setiger*, pl. viii, fig. 14, *angularis*, p. 274, Guatemala, *punctiventris*, fig. 17, *chiriquensis*, fig. 16, Panama, p. 275, *denticulatus*, Centr. America, p. 276, *aberrans*, Guatemala, pl. viii, fig. 19, p. 277, SHARP, Biol. Centr. Am. Col. ii (1), n. spp.

Bruchypeplus vicinus, Panama, pl. viii, fig. 20, *costatus*, Guatemala, fig. 22, *brachypterus*, p. 278, *staphylinoides*, fig. 21, *conotoloides*, fig. 24, p. 279, Centr. America, *lispinoides*, Guatemala, fig. 25, *nigripennis*, Panama, fig. 23, p. 280, SHARP, Biol. Centr. Am. Col. ii (1), n. spp.

Halepopeplus politus, Panama, p. 280, pl. ix, fig. 4, *optatus*, Nicaragua, fig. 5, p. 281, SHARP, Biol. Centr. Am. Col. ii (1), n. spp.

Cyllæus prolixus, p. 281, pl. ix, fig. 3, *prolongatus*, fig. 1, *sunilensis*, fig. 2, p. 282, Centr. America, SHARP, Biol. Centr. Am. Col. ii (1), n. spp.

Conotelus stenoides, Murr., figured, pl. ix, fig. 7; Biol. Centr. Am. Col. ii (1).

C. nigricornis, pl. ix, fig. 8, *hondurensis*, *chiriquensis*, fig. 9, p. 284, *latitarsis*, *guatemalensis*, p. 285, Centr. America, SHARP, Biol. Centr. Am. Col. ii (1), n. spp.

Macrostola picea, Centr. America, SHARP, p. 286, pl. ix, fig. 6, Biol. Centr. Am. Col. ii (1), n. sp.

Carpophilus lugubris, Murr., pl. ix, fig. 11, *lucertosus*, fig. 12, = (*purpureipennis*, Murr.), p. 291, *ligneus*, fig. 13, *mexicanus*, Reitt., fig. 20, = (*limbipennis*, Reitt.), p. 298, figured; *C. floralis*, Er., distinguished from *pullipennis*, Say, p. 300: SHARP, Biol. Centr. Am. Col. ii (1).

C. funebris, pl. ix, fig. 10, *riduatus*, p. 288, *similaris*, p. 289, *transitans*, *deflexus*, p. 290, *comatus*, p. 292, fig. 14, *obscurus*, *alticola*, *epuræoides*, fig. 16, p. 293, *dulcis*, p. 294, *confertus*, *erichsoni*, fig. 18, p. 295, *elaterinus*, fig. 15, *palmatus*, fig. 17, p. 296, *crassus*, *ventralis*, p. 297, *concolor*, p. 298, *curripes*, p. 299, *canescens*, *longiventris*, fig. 19, p. 301, *senilis*, fig. 21, p. 302, *receptus*, *deceptor*, fig. 22, p. 303, Centr. America, SHARP, Biol. Centr. Am. Col. ii (1): n. spp.

Eumystrops, n. g., for *E. centralis*, n. sp., Panama, pl. ix, fig. 23; SHARP, p. 304, Biol. Centr. Am. Col. ii (1).

Meligethes auripilis, China, REITTER, Hor. Ent. Ross. xxiii, p. 558, n. sp.

Cychramus luteus and *fungicola*, united as the sexes of one species; SHARP, P. E. Soc. 1889, p. xxxvi.

Ipsine: stridulating organ in the subfamily; SHARP, P. E. Soc. 1889, p. xlvi.

Librodor forcipatus, Moupin, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 12, n. sp.

TROGOSITIDÆ.

[Cf. FAIRMAIRE (236), KOENIG (459), LÉVEILLÉ (504, 505, 506, 507, 508), LEWIS (512), OLLIFF (610), REITTER (672, 687).]

Syntelia davidis, Moupin, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 11, n. sp.

Shoguna, n. g., for *S. rufotestacea*, n. sp., Japan; LEWIS, p. 274, Ann. N. H. (6) iv.

Holocephala, Fairm., note on; LÉVEILLÉ, Bull. Soc. Ent. Fr. (6) ix, p. liv. *Holocephala*, Fairm., = (*Shoguna* Lewis); LÉVEILLÉ, Bull. Soc. Ent. Fr. (6) ix, p. cxi.

Nemosoma elongatum, L., var., = (*corsicum*, Reitt.); LÉVEILLÉ, Bull. Soc. Ent. Fr. (6) ix, p. viii.

Nemosoma simoni, Venezuela, LÉVEILLÉ, Bull. Soc. Ent. Fr. (6) ix, p. viii, and Ann. Soc. Ent. Fr. (6) ix, p. 167; *N. picta*, Bahia, LÉVEILLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 251 : n. spp.

Airora longicollis, Guer., = (*clivinoidea*, Reitt.); LÉVEILLÉ, p. xlv, Bull. Soc. Ent. Fr. (6) ix.

Temnochila jekeli, Reitt. = (*sennervillei*, Lev.); *tristis*, Muls., = (*cribricollis*, Reitt.); LÉVEILLÉ, Bull. Soc. Ent. Fr. (6) ix, p. xxii. *T. metallica* = (*mexicana*, Reitt.); LÉVEILLÉ, Bull. Soc. Ent. Fr. (6) ix, p. xlv. *T. barbata*, Lec., noticed; LÉVEILLÉ, Bull. Soc. Ent. Fr. (6) ix, p. xlv.

T. curta, Guiana, LÉVEILLÉ, Notes Leyd. Mus. xi, p. 139; *T. planipennis* = (*metallica*, Reitt., nec Perch.); LÉVEILLÉ, Ann. Soc. Ent. Fr. (6) ix : n. spp.

Marnia, n. g., for *M. sipolisi*, n. sp., Brazil; LÉVEILLÉ, Bull. Soc. Ent. Fr. (6) ix, p. xxi.

M. sullei, Venezuela, LÉVEILLÉ, Bull. Soc. Ent. Fr. (6) ix, p. cxl, n. sp.

Melambia tekkensis, Transcaspian, KOENIG, Hor. Ent. Ross. xxiii, p. 301, n. sp.

Tenebroides bipustulatus var. = (*impressifrons*, Reitt.); LÉVEILLÉ, Bull. Soc. Ent. Fr. (6) ix, p. viii.

T. ritsemæ, Colombia, LÉVEILLÉ, p. 139, Notes Leyd. Mus. xi; *T. subvirescens*, *ornatus*, p. 252, *viridescens*, *longicornis*, p. 253, *rufipes*, p. 254, Brazil, LÉVEILLÉ, Ann. Soc. Ent. Fr. (6) ix : n. spp.

Trogosita crenicollis, Guer., referred to *Melambia*; LÉVEILLÉ, Bull. Soc. Ent. Fr. (6) ix, p. lxii. *T. latreillei* = (*marginatus*, Latr.); LÉVEILLÉ, Bull. Soc. Ent. Fr. (6) ix, n. sp.

Paralimnoria, Oll., to be removed from *Trogositidæ*; LÉVEILLÉ, Bull. Soc. Ent. Fr. (6) ix, p. lxii. *P. bipartita*: figured, pl. vii, fig. 9; noticed, p. 387; Ann. Soc. Ent. Fr. (6) ix.

Leperina tibialis, Japan, REITTER, p. 217, Wien. ent. Z. viii, n. sp.

Ostoma japonica, Sapporo, REITTER, p. 217, Wien. ent. Z. viii; *O. pudicum*, Lord Howe I., OLLIFF, Lord Howe Island, p. 80, pl. vi, fig. 7 : n. spp.

Ostomodes pallida, Motsch., = (*pilosula*, Cr., *lagrioides*, and *dohrni*, Reitt.); LÉVEILLÉ, Bull. Soc. Ent. Fr. (6) ix, p. xlv.

Pellasticta reitteri and *tuberculata*, characters of ; LEWIS, Ent. M. M. xxv, p. 432.

Thymalus subtilis, Caucasus, *oblongus*, Siberia, REITTER, p. 278, Deutsche e. Z. 1889, n. spp.

COLYDIIDÆ AND RHYSODIDÆ.

[Cf. OLLIFF (610), REITTER (672, 681).]

Esarcus, referred to *Mycetophagidæ* ; SEIDLITZ, p. 147, Deutsche e. Z. 1889.

E. baudii, Maritime Alps, SEIDLITZ, p. 149, Deutsche e. Z. 1889, n. sp.

Neotrichus lucifugus, Lord Howe I., OLLIFF, p. 80, Lord Howe Island, n. sp.

Phormesa epitheca, Lord Howe I., OLLIFF, p. 81, Lord Howe Island, n. sp.

Gempylodes tmetus, Lord Howe I., OLLIFF, p. 81, Lord Howe Island, n. sp.

Anommatus pusillus and *kiesenwetteri*, synonymy discussed at length : REITTER, pp. 305 & 306, Deutsche e. Z. 1889.

Pycnomerus mæstus, Lord Howe I., OLLIFF, p. 81, Lord Howe Island, n. sp.

Cerylon torosum, Sumatra, REITTER, p. 7, Notes Leyd. Mus. xi, n. sp.

Clinidium calcaratum and *sculptile*, variation of ♂ characters ; BLANCHARD, Psyche, v, pp. 165 & 166.

C. marginicolle, Lenkoran, REITTER, p. 23, Deutsche e. Z. 1889, n. sp.

Rhysodes exaratus and *americanus*, differential characters of ; LEWIS, Ent. M. M. xxv, p. 432.

CUCUJIDÆ.

[Cf. FAUVEL (258), GROUVELLE (340, 341, 342), REITTER (672, 695).]

Hectarthrum angustatum, Andaman Is., GROUVELLE, Bull. Soc. Ent. Fr. (6) ix, p. xxxiii, n. sp.

Ancistria apicalis, p. 314, *lewisi*, p. 315, Japan, REITTER, Wien. ent. Z. viii, n. spp.

Prostomis latoris, Japan, REITTER, p. 315, Wien. ent. Z. viii, n. sp.

Prostominia, n. g., p. 315, for *P. lewisi*, n. sp., Japan, p. 316 : REITTER, Wien. ent. Z. viii.

Narthecius grandiceps, habits ; SCHWARZ, P. E. Soc. Washington, i, p. 165.

Hyliota arboreus, Japan, REITTER, p. 317, Wien. ent. Z. viii ; *H. africana*, Assinia, GROUVELLE, Ann. Soc. Ent. Fr. (6) ix, p. 101, pl. v, fig. 1 : n. spp.

Dendrophagus longicornis, Japan, REITTER, p. 316, Wien. ent. Z. viii, n. sp.

Platanus humeralis, Reitt. described, p. 101, figured, pl. v, fig. 2 ; GROUVELLE, Ann. Soc. Ent. Fr. (6) ix.

Telephanus, tabulation of the characters of the species found in Venezuela and Colombia : GROUVELLE, Ann. Soc. Ent. Fr. (6) ix, pp. 160-162.

Telephanus subpubescens, Ega, GROUVELLE, Ann. Soc. Ent. Fr. (6) ix, p. 102; *T. parallelus*, pl. vi, fig. 5, p. 157, *ovalis*, fig. 3, *dubitabilis*, fig. 2, p. 158, *melanocephalus*, fig. 1, *elongatus*, fig. 4, p. 159, Venezuela, GROUVELLE, Ann. Soc. Ent. Fr. (6) ix : n. spp.

Cryptamorphus sculptifrons, Japan, REITTER, p. 320, Wien. ent. Z. viii, n. sp.

Plutamops thiemei, Colombia, GROUVELLE, Ann. Soc. Ent. Fr. (6) ix, p. 102, n. sp.

Læmophilæus basalis, habits; SCHWARZ, P. E. Soc. Washington, i, p. 164.

L. submonilis, *cribratus*, p. 317, *fenestratus*, p. 318, *nigro-ornatus*, *levinsi*, p. 319, Japan, REITTER, Wien. ent. Z. viii; *L. mistus*, pl. v, fig. 5, *mathani*, fig. 6, Ega, p. 103, *miscellus*, Assinia, fig. 7, p. 104, GROUVELLE, Ann. Soc. Ent. Fr. (6) ix : n. spp.

Silvanus mercator, France, &c. (probably cosmopolitan), FAUVEL, Rev. d'Ent. viii, p. 132; *S. ocellatus*, Abyssinia, pl. v, fig. 8, p. 104, *tenuis*, fig. 9, p. 105, *mediocris*, fig. 10, p. 106, Assinia, GROUVELLE, Ann. Soc. Ent. Fr. (6) ix : n. spp.

Psammæchus hacquardi, Zanzibar, GROUVELLE, Ann. Soc. Ent. Fr. (6) ix, p. 107, pl. v, fig. 11, n. sp.

Airaphilus depressus, Araxes Valley, REITTER, p. 278, Deutsche e. Z. 1889; *A. abeillei*, Syria, GROUVELLE, Ann. Soc. Ent. Fr. (6) ix, p. 107, pl. v, fig. 12 : n. spp.

Cuthartus nitidus, Venezuela, GROUVELLE, Ann. Soc. Ent. Fr. (6) ix, p. 162, pl. vi, fig. 6, n. sp.

CATOPOCHROTIDÆ.

Catopochrotidæ, new family near *Cryptophagidæ*, defined (p. 289) for the following :—

Catopochrotus, n. g., for *C. crematogastri*, n. sp., Araxes Valley, pl. iv, figs. 1 & 2, REITTER, p. 290, Wien. ent. Z. viii.

CRYPTOPHAGIDÆ, LATHREIIDÆ, MYCETOPHAGIDÆ.

[Cf. BELON (47, 48, 49), FLEUTIAUX & SALLÉ (277), REITTER (672, 676, 680, 683, 688, 693), SEIDLITZ (790).]

Cryptophagus (*Mnionomus*) *arazicola*, Araxes Valley, REITTER, p. 21, Deutsche e. Z. 1889; *C. latangulus*, Japan, REITTER, p. 303, Wien. ent. Z. viii : n. spp.

Haplulophus albellus, Taschkend, REITTER, p. 313, Deutsche e. Z. 1889, n. sp.

Henoticus reitteri, Europe, SEIDLITZ, Fauna trans. p. 272, n. sp.

Cænoscelis brisoutii, Europe, SEIDLITZ, Fauna trans. p. 272, Arten; *C. sibirica*, E. Siberia, p. 309, *fleischeri*, Hungary, p. 310, REITTER, Deutsche e. Z. 1889 : n. spp.

Atomaria godarti, Guill., note on; REITTER, p. 125, Wien. ent. Z. viii.

A. frondicola, Europe, REITTER, Deutsche e. Z. 1889, p. 372; *A. dilatata*, p. 303, *lucida*, p. 304, Japan, REITTER, Wien. ent. Z. viii : n. spp.

Atomaropus, n. g., for *A. lewisi*, n. sp., Japan; REITTER, p. 302, Wien. ent. Z. viii.

Diphyllus humeralis, lewisii, inequalis, p. 299, *æqualis, flexuosus, monomoratus*, p. 300, Japan, REITTER, Wien. ent. Z. viii : n. spp.

Supplement to the monograph of the *Lathridiidae* of France; BELON (47). Critical remarks on the classification of the family, some genera and some doubtful synonymy; BELON, Rev. d'Ent. viii, pp. 50-60. Synonymical remarks on several species of *Lathridiidae*; REITTER, Deutsche e. Z. 1889, pp. 303-305.

Lathridius subnudus, p. 64, *belonianus*, p. 65, Circassia, REITTER, Wien. ent. Z. viii; *L. australicus* = (*sculptilis*, Bel., nec Lec.), Australia, BELON, p. xix, C.R. ent. Belg. xxxiii; *L. (Coninomus) longiceps*, p. 221, *simosi*, p. 222, Venezuela, BELON, Ann. Soc. Ent. Fr. (6) ix : n. spp.

Corticaria beloni, Araxes Valley, REITTER, p. 21, Deutsche e. Z. 1889, n. sp.

Dasycerus, note on the N. American species; BELON, C.R. ent. Belg. xxxiii, pp. xvii & xviii.

Monædus lecontei, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 391, pl. 7, fig. 10, n. sp.

Merophysia bistrigata, Crete, REITTER, p. 255, Deutsche e. Z. 1889, n. sp.

Pseudotriphyllus insignis, ruftarsis, Japan, REITTER, p. 245, Wien. ent. Z. viii, n. spp.

Triphyllus seriatus, Japan, REITTER, p. 246, Wien. ent. Z. viii, n. sp.

Litargus lewisi, unifasciatus, Japan, REITTER, p. 246, Wien. ent. Z. viii, n. spp.

Litargops maculosus, Japan, REITTER, p. 247, Wien. ent. Z. viii, n. sp.

Tritoma elongata, p. 247, *pustulosa, grandis*, p. 248, *undulata*, p. 249, Japan, REITTER, Wien. ent. Z. viii, n. spp.

Atrilomus lewisi, Japan, REITTER, p. 249, Wien. ent. Z. viii, n. sp.

THORICTIDÆ, DERMESTIDÆ, BYRRHIDÆ.

[Cf. BAUDI (40), CASEY (138), FAIRMAIRE (236), LEWIS (513). REITTER (672, 676, 684, 700).]

Thorictes striatus, Ordubad, REITTER, p. 278, Deutsche e. Z. 1889, n. sp.

Dermestes rufinus, injurious to goat skins; JONES, Ins. Life, ii, p. 63: larva described; REY, Bull. Soc. Ent. Fr. (6) ix, p. ccxxvi.

D. helmi, Danzig, REITTER, p. 279, Deutsche e. Z. 1889, n. sp.

Trogoderma cercyonoides, note on, with n. var. *demaisioni*; REITTER, p. 127, Wien. ent. Z. viii. *T. insulare*, Chev., larva noticed; LUCAS, Bull. Soc. Ent. Fr. (6) ix, p. cxli: metamorphoses; LUCAS, Bull. Soc. Ent. Fr. (6) ix, p. ccc.

T. amœnula, China, REITTER, Hor. Ent. Ross. xxiii, p. 559, n. sp.

Attagenus angustatus, Ball., referred to *Hadrotoma*; REITTER, p. 163, Wien. ent. Z. viii. *A. pellio*, description of larva; HENSOLDT, J. N. Y. Micr. Soc. v, pp. 34-38.

A. quadrinotus, Ordubad, REITTER, p. 280, Deutsche e. Z. 1889; *A. rufipictus*, Thibet, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 13; *A. molitor*, China, REITTER, Hor. Ent. Ross. xxiii, p. 559: n. spp.

Anthrenus ærophularia, metamorphoses, habits in N. America; RILEY, Ins. Life, ii, pp. 127-130. *A. zebra* n. var. *tigrinus*; REITTER, p. 281.

Deutsche e. Z. 1889. *A. pimpinellæ* n. var. *flavidulus* ; REITTER, p. 23, Deutsche e. Z. 1889.

A. rotundulus, Araxes Valley, REITTER, l. c.; *A. funebris*, *A. (Florilinus) sordidulus*, Grecian Is., REITTER, p. 256, Deutsche e. Z. 1889 ; *A. (Anthrenops) zebra*, Ordubad, REITTER, p. 280, Deutsche e. Z. 1889 : n. spp.

Byrrhus kamtschaticus and *fasciatus*, differential characters of ; LEWIS, Ent. M. M. xxv, p. 433.

Seminolus starcki, Circassia, REITTER, p. 98, Wien. ent. Z. viii, n. sp.

Pedilophorus apfelbecki, Bosnia, REITTER, p. 279, Deutsche e. Z. 1889, n. sp.

Simplocaria jugicola, Piedmont, BAUDI, Ann. Acc. Agr. Tor. xxxii, p. 103, n. sp.

Nosodendron asiaticum, Japan, LEWIS, Ent. M. M. xxv, p. 229, n. sp.

Bathriophorus, *Physemus*, *Ditaphrus*, discussed; *Physemus* = (*Ditaphrus*, Casey), and *P. minutus* = (*D. scymnoides*, Casey): CASEY, Ann. N. York Ac. v, p. 160.

Limnichus, monograph of N. American species of ; CASEY, Ann. N. York Ac. v, pp. 145-160.

Eulimnichus, p. 146, *Limnichites*, *Lichminus*, *Limnichoderus*, p. 147, n. subgg. of *Limnichus* ; CASEY, Ann. N. York Ac. v.

Limnichus perpolitus, p. 151, *perforatus*, *tenuicornis*, p. 155, *naviculatus*, p. 156, *seriatus*, p. 158, *punctiventris*, p. 159, N. America, CASEY, Ann. N. York Ac. v, n. spp.

Chelonarium villosum, Macleay, E. India, noticed as omitted from Munich Catalogue ; RISEMA, p. 47, Notes Leyd. Mus. xi.

PARNIDÆ.

[Cf. BERG (51), CASEY (138), FAIRMAIRE (242), FLACH (270), GROUVELLE (341, 343), KUWERT (478), REITTER (681).]

Lutochrus acuminatus, Venezuela, pl. vi, fig. 10, *germari*, Brazil, GROUVELLE, p. 163, Ann. Soc. Ent. Fr. (6) ix.

Parnus, &c., female characters in ; GROUVELLE, Bull. Soc. Ent. Fr. (6) ix, p. xix.

Pelonomus simplex, S. America, BERG, p. 155, An. Un. B. Aires, vi, n. sp.

Potamophilus oxypterus, Madagascar, FAIRMAIRE, C.R. ent. Belg. xxxiii, p. xc, n. sp.

Hydretus, n. g., for *H. dermestoides*, n. sp., Madagascar ; FAIRMAIRE, p. xc, C.R. ent. Belg. xxxiii.

Helmoparnus glaber, Venezuela, GROUVELLE, Ann. Soc. Ent. Fr. (6) ix, p. 164, pl. vi, figs. 7a & b, n. sp.

Throscinus politus, Texas, CASEY, Ann. N. York Ac. v, p. 162, n. sp.

Helmis velutina, Reiche, and *syriaca*, All., noticed ; GROUVELLE, Bull. Soc. Ent. Fr. (6) ix, p. lxxx. *H. coyei*, All., and *Macronychus rioloides*, Reitt., referred to *Microdes*, Motsch. ; GROUVELLE, Bull. Soc. Ent. Fr. (6) ix, p. lxxx.

H. simoni, p. 164, pl. vi, fig. 8, *atra*, p. 165, fig. 9, Venezuela, GROUVELLE, Ann. Soc. Ent. Fr. (6) ix : n. spp.

Riolus sodalis and allies, characters of ; FLACH, S. E. Z. I, pp. 138 & 139.

R. substriatus, Algeria, GROUVELLE, Bull. Soc. Ent. Fr. (6) ix, p. lxxi: *R. seidlitsi*, *sauteri*, *steineri*, p. 24, *erichsoni*, *lentzi*, *mulsanti*, p. 25, Europe, KUWERT, Soc. Ent. iv : n. spp.

Lámnius tuberculatus, Müll., = (*dargelasi*, Latr., *subparallelus*, Fairm., *fuscipes*, Reiche, *interruptus*, Fairm.) ; GROUVELLE, Bull. Soc. Ent. Fr. (6) ix, p. lxxix. *L. villosocostatus*, Reiche, referred to *Riolus* ; GROUVELLE, t. c. p. lxxx.

Dupophilus brevis, Muls., = (*Latelmis insignis*, Reitt.) ; GROUVELLE, Bull. Soc. Ent. Fr. (6) ix, p. lxxx.

Esolus carpatanus, *czwalinæ*, *dossowi*, *politus*, *kunowi*, Europe, KUWERT, Soc. Ent. iv, p. 33, n. spp.

Stenelmis semirubrum, *ritsemæ*, Sumatra, REITTER, p. 8, Notes Leyd. Mus. xi, n. spp.

LUCANIDÆ and PASSALIDÆ.

[Cf. ALBERS (5, 6), BATES (324), CASEY (138), POLL (641), RITSEMA (723, 730).]

List of *Lucanidæ* of Sumatra ; RITSEMA, Notes Leyd. Mus. xi, pp. 233-236.

Auzicerus platyceps, Wat., figured ; WATERHOUSE, Aid, pl. 181, fig. 1.

Lucanus dama, structure of epipharynx ; PACKARD, Psyche, v, p. 226.

L. gracilis, Sikkim, ALBERS, p. 319, Deutsche e. Z. 1889, n. sp.

Odontolabis intermedius, Philippines, POLL, p. 225, Notes Leyd. Mus. xi, n. sp.

Prosopocelus forficatus, Sumatra, ALBERS, p. 232, Deutsche e. Z. 1889, n. sp.

Eurytrachelus alcides, Voll., and *eurycephalus*, synonymical note ; ALBERS, p. 233, Deutsche e. Z. 1889.

E. hansteini, Sumatra, ALBERS, p. 235, Deutsche e. Z. 1889, n. sp.

Gnaphaloryx taurus, Fab., and *opacus*, Burm., distinctions of ; ALBERS, p. 236, Deutsche e. Z. 1889.

Ægus capitatus, Westw., ♂ minor described ; RITSEMA, p. 229, Notes Leyd. Mus. xi.

Æ. fornicatus, Sumatra, ALBERS, p. 238, Deutsche e. Z. 1889, n. sp.

Nigidius ampicollis, Qued., *lævigatus*, Har., *dentifer*, Alb., localities of ; POLL, p. 228, Notes Leyd. Mus. xi.

N. hugeni, Sumatra, RITSEMA, Notes Leyd. Mus. xi, p. 1, n. sp.

Platycerus, sexual distinctions in ; CASEY, Ann. N. York Ac. v, p. 163.

P. parvicollis, p. 164, *pacificus*, p. 165, California, CASEY, Ann. N. York Ac. v, n. spp.

Æsulæ smithi, Mexico, BATES, p. 382, Biol. Centr. Am. Col. ii (2), n. sp.

Procolejus nudicostis, Mexico, BATES, p. 383, Biol. Centr. Am. Col. ii (2), n. sp.

Soranus depressifrons, Mexico, BATES, p. 384, Biol. Centr. Am. Col. ii (2), n. sp.

SCARABÆIDÆ.

[*Cf.* BATES (37, 324), BEDEL (45), CASEY (138), BLACKBURN (74, 76), BRENSKE (100, 101), FAIRMAIRE (236, 240), FLEUTIAUX & SALLÉ (277), HELLER (368), HEYDEN (376, 380), KOENIG (459), MINGAZZINI (578, 579, 580), NEVINSON (598), NONFRIED (605), OLLIFF (610), QUEDENFELDT (652), REINET (671), REITTER (673, 689, 690, 699), RIVERS (733, 735), SÉMENOW (799), SMITH (831, 832), VOELTZKOW (881), WATERHOUSE (905), and *Cetoniini*, p. 122.]

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Glyptotheu, n. g., for *G. whiteheadi*, n. sp., N. Borneo; BATES, p. 390, P. Z. S. 1889.

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Macronota apicalis, G. & P., referred to *Discopeltis*, and redescribed; POLL, Notes Leyd. Mus. xi, p. 81.

Teniodera ditissima, N. Borneo, BATES, P. Z. S. 1889, p. 390, n. sp.

Stenonota, n. g., near *Teniodera*, p. 29, for *S. semirugata*, n. sp., China, p. 30, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix.

Diphronitis cruenta, Gerst., = (*Porphyrobapta tigrina*, Kr.) ; POLL, Notes Leyd. Mus. xi, p. 64.

Gnathocera hyacinthina, Jans., figured; WATERHOUSE, Aid, pl. 182, fig. 7.

Stenotarsia punctiventris, Wat., figured; WATERHOUSE, Aid, pl. 182, fig. 2.

Stephanucha bispinis, Mexico, BATES, p. 362, Biol. Centr. Am. Col. ii (2), n. sp.

Euphoria lesueuri, ♀ = (*latreillii*, auct), *westermanni*, characters of,

p. 363, *candezei*, figured, pl. xxiii, fig. 3, *leucographa*, variation of, p. 364, *lineoligera*, pl. xxiii, fig. 4, *biguttata*, fig. 2, *pulchella*, fig. 6, figured, *precaria*, Jans., note on, p. 368, *iridescent*, pl. xxii, fig. 1, *mystica*, Thoms., pl. xxiii, fig. 5, figured, *mystica*, described, p. 369, *avita*, Jans., figured, pl. xxiii, figs. 8 & 9, noticed, p. 370, *humilis*, Bl., characters of, p. 372, *histrionica*, Thoms., noticed, p. 374, *pulchella*, variation noticed, p. 416; BATES, Biol. Centr. Am. Col. ii (2).

E. yucateca, p. 365, *leucopyge*, p. 366, Mexico, *chontalensis*, Nicaragua, p. 368, pl. xxiii, fig. 10, *fulvoola*, p. 370, pl. xxiii, fig. 7, *nigriventris*, *quadricollis*, *atra*, p. 371, Mexico, *eximia*, Costa Rica, p. 372, *monticola*, Mexico, p. 415, BATES, Biol. Centr. Am. Col. ii (2), n. spp.

Chlorixanthæ, n. g., for *Euphoria flavoviridis*, Thoms., which is figured, pl. xxi, fig. 12; BATES, p. 374, Biol. Centr. Am. Col. ii (2).

Diaphonia olliffiana, N. S. Wales, p. 127, *adusta*, W. Australia, p. 129, JANSON, P. Linn. Soc. N.S.W. (2) iv, n. spp.

Pachnoda simonsi, Jans., = (*Psadacoptera simulatrix*, Kr.) ; KRAATZ, p. 422, Deutsche e. Z. 1889.

Cetonia squamosa, Lef., = (*trojana*, Gory) n. var. *maura* ; BEDEL, Ann. Soc. Ent. Fr. (6) ix, p. 87. *C. aurata*, metamorphosis of pupa ; PLANET, Le Nat. 1889, p. 204. *C. brevitarsis*, Lew., n. var. *fairmairei* ; KRAATZ, Deutsche e. Z. 1889, p. 379.

C. martini, Algeria, BEDEL, Ann. Soc. Ent. Fr. (6) ix, pp. 87 & 91 ; *C. potanini*, p. 669, *angulicollis*, p. 671, China, KRAATZ, Hor. Ent. Ross. xxiii ; *C. levicostata*, p. 30, *nitididorsis*, *daridiana*, p. 31, China, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix : n. spp.

Simorrhina staudingeri, Kr., figured ; WATERHOUSE, Aid, pl. 182, fig. 4.

Enoplotarsus deserticola, Luc., sexes described ; BEDEL, Ann. Soc. Ent. Fr. (6) ix, p. 95.

Orythyrea, tabulation of the palaearctic genera allied to, and their species ; REITTER, Ent. Nachr. xv, pp. 37-40.

Tropinota turanica, *spinifrons*, Turcomania, REITTER, Ent. Nachr. xv, p. 38, n. spp.

Charadronota curvata, Jans., figured ; WATERHOUSE, Aid, pl. 182, fig. 3. *C. curvata*, Jans., = (*quadrilunulata*, Kr.) ; POLL, Notes Leyd. Mus. xi, p. 64.

Macroma oberthuri, Jans., figured ; WATERHOUSE, Aid, pl. 182, fig. 5.

M. superba = (*gloriosa*, Westw., nec Mohn.), Siam, POLL, p. 143, Notes Leyd. Mus. xi, n. sp.

Gennuchinus v-notatus, Westw., figured, pl. xxiii, fig. 14 ; Biol. Centr. Am. Col. ii (2).

Lissomelas, n. g., for *L. fohri*, n. sp., Mexico ; BATES, p. 376, Biol. Centr. Am. Col. ii (2).

Trichius fasciatus and *abdominalis*, variation of described ; HEYDEN, Deutsche e. Z. 1889, pp. 385-388. *T. fasciatus*, melanic example ; LEPRIEUR, Bull. Soc. Ent. Fr. (6) ix, p. cxxvi.

Dialithus magnificus figured, pl. xxiii, fig. 17 ; Biol. Centr. Am. Col. ii (2).

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Cœlocratus anescens, Mexico, p. 381, pl. xxiii, fig. 13, BATES, Biol. Centr. Am. Col. ii (2), n. sp.

Clinterocera discipennis, China, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 32, n. sp.

Polyplastus assarius, Jans., figured; WATERHOUSE, Aid, pl. 182, fig. 6.

Osmoderma scabra, Beauv., larva described; BEUTENMULLER, Psyche, v, p. 281.

Vulgus hemipterus injurious to wood, near Paris; FALLOU (245).

BUPRESTIDÆ.

[Cf. BERG (51), BLACKBURN (74), CHITTENDEN (139), FAIRMAIRE (236, 240), FLEUTIAUX & SALLÉ (277), GANGLBAUER (302), GUILLEBEAU (344), JAKOWLEW (416), LUMHOLZ (534), MARSEUL (550), OLLIFF (610), POLL (638), REITTER (672), REY (704), RITSEMA (731), SÉMENOW (800), WATERHOUSE (324, 905).]

Sternocera hunteri, with var. *fasciata*, E. Africa, WATERHOUSE, p. 361, Ann. N. H. (6) iii, n. sp.

Julodis plusoni, Persia, MARSEUL, L'Ab. xxvi, p. 241, n. sp.

Chalcophora virginienensis, varietal note; WATERHOUSE, p. 167, Biol. Centr. Am. Col. iii (1).

Hippomelas: *Gyascutus sphenicus*, Lec., referred to this; WATERHOUSE, p. 172, Biol. Centr. Am. Col. iii (1).

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Agæocera: *Halecia gentilis*, Horn, referred to this; WATERHOUSE, p. 169, Biol. Centr. Am. Col. iii (1).

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Psiloptera zirettoides, *crassiuscula*, p. vii, *truncatipennis*, *cyclopyga*, p. viii, Madagascar, FAIRMAIRE, C.R. ent. Belg. xxxiii; *P. geniculata*, Mexico, WATERHOUSE, p. 172, Biol. Centr. Am. Col. iii (1) : n. spp.

Aurigena lugubris n. var. *subcostata*; REITTER, p. 281, Deutsche e. Z. 1889.

Lampra, revision of; GUILLEBEAU, Rev. d'Ent. viii, pp. 1-12, and GOZIS, t. c. pp. 89-91 & 209.

L. vicina, Asia Minor, p. 3, *modesta*, S. France, p. 5, *dices*, Europe, p. 7 (but this latter is *decipiens*, Mann., GOZIS, p. 91), GUILLEBEAU, Rev. d'Ent. viii; *L. subangulosa*, China, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 32 : n. spp.

Buprestis maculiventris, Say, structure of epipharynx; PACKARD, Psyche, v, p. 226.

B. nikolskii, Lake Aral, SÉMENOW, Bull. Mosc. (v.s.) ii, p. 682, n. sp.

Ancylochira salamoni, Th., = (*dauidis*, Fairm., = *nikolskii*, Sem.): REITTER, p. 231, Wien. ent. Z. viii.

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Astræus, monograph of; POLL, Tijdschr. Ent. xxxii, pp. 79–110, pl. ii & iii.

A. irregularis, p. 86, pl. ii, fig. 1, *lineatus*, p. 87, fig. 2, *multinotatus*, p. 89, fig. 3, *fruterculus*, p. 92, fig. 6, *badeni*, p. 93, fig. 7, *junsoni*, p. 94, fig. 8, *crassus*, p. 95, fig. 9, *prothoracicus*, p. 98, pl. iii, fig. 11, *vittatus*, p. 99, fig. 12, *oberthuri*, p. 100, fig. 13, *simulator*, p. 102, fig. 15, *dilutipes*, p. 105, fig. 17, *splendens*, p. 108, fig. 19, Australia, POLL, Tijdschr. Ent. xxxii, n. spp.

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Melobasis empyria, Lord Howe I., OLLIFF, p. 83, Lord Howe Island, n. sp.

Anthazia fasciata, Mexico, WATERHOUSE, Biol. Centr. Am. Col. iii (1), n. sp.

Hyperantha stempelmanni, Cordoba, BERG, p. 154, An. Un. B. Aires, vi, n. sp.

Stigmodera alternata, Queensland, LUMHOLZ, Among Cannibals, pp. 197 & 220 [cf. also C.R. ent. Belg. xxxiii, p. clxxxiii], n. sp.

Tylauchenia compacta, Cordoba, BERG, p. 152, An. Un. B. Aires, vi, n. sp. *Acmaodera farinosa*, Roche., = (*dermestoides*, Friv.) ; HEYDEN, p. 202, Wien. ent. Z. viii. *A. boryi* n. var. *obscura*; REITTER, p. 281, Deutsche e. Z. 1889.

A. oertzeni, Crete, GANGLBAUER, p. 55, Deutsche e. Z. 1889; *A. proxima*, p. 178, *trifasciata*, p. 179, *delectabilis*, p. 180, pl. ix, fig. 14, Mexico, WATERHOUSE, Biol. Centr. Am. Col. iii (1) : n. spp.

Sphenoptera artemisiae, Ordubad, REITTER, p. 282, Deutsche e. Z. 1889; *S. extensorcarinata*, Shan-si, p. 84, *S. (Oplistura) semenowi*, p. 85, *S. (Chrysoblemma) potanini*, p. 86, Mongolia, JAKOWLEW, Hor. Ent. Ross. xxiii : n. spp.

Actenodes metallica, Guatemala, WATERHOUSE, p. 181, Biol. Centr. Am. Col. iii (1), n. sp.

Chrysobothris delectabilis, Panama, p. 183, pl. ix, fig. 13, *densa*, *aqualis*, Mexico, p. 184, WATERHOUSE, Biol. Centr. Am. Col. iii (1), n. spp.

Callipyndax cupreiventris, Wat., figured: WATERHOUSE, Aid, pl. 181, fig. 4.

Maschalix latipennis, Wat., figured; WATERHOUSE, Aid, pl. 181, fig. 6. *Armenosoma atrum*, Wat., figured; WATERHOUSE, Aid, pl. 181, fig. 5.

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Cyphothorax palliolatus, Chev., figured, pl. iv, fig. 4; Biol. Centr. Am. Col. ii (2).

Autarcontes abdominalis, Nicaragua, WATERHOUSE, p. 49, pl. iv, fig. 6. Biol. Centr. Am. Col. iii (1), n. sp.

Omochyseus terminalis, figured, pl. iv, fig. 5; Biol. Centr. Am. Col. iii (1).

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Taphrocerus costatus, Centr. America, p. 127, *fasciatus*, *nigritulus*, Panama, *mexicanus*, p. 128, *guttatus*, Guatemala, *psilopteroides*, Centr. America, *purpureipennis*, Panama, p. 129, *communis*, *uniformis*, Mexico, p. 130, WATERHOUSE, Biol. Centr. Am. Col. iii (1), n. spp.

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Cydindromorphus strigatulus, Hyères, p. clx, *bifrons*, Bohemia, p. clxi, REY, Bull. Soc. Ent. Fr. (6) ix; *C. araxidis*, Araxes Valley, REITTER, p. 24, Deutsche z. Z. 1889: n. spp.

Aphanisticus krugeri, Java, RITSEMA, p. 237, Notes Leyd. Mus. xi, n. sp.

Lius guadeloupensis, Antilles, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 404; *L. dissimilis*, pl. vii, fig. 18, p. 135, *variabilis*, Guatemala, *parvulus*, Panama, p. 136, WATERHOUSE, Biol. Centr. Am. Col. iii (1), n. spp.

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[Cf. FLEUTIAUX & SALLÉ (277), REITTER (672, 682).]

Throscus : table of the European species, REITTER, pp. 35 & 36 ; sexual characters of discussed, pp. 37 & 38 ; Wien. ent. Z. viii.

T. corsicus, Corsica, REITTER, p. 35, Wien. ent. Z. viii, n. sp.

Formax calceatus, Say, *hornii*, Bonv., notes on ; BLANCHARD, Ent. Am. v, p. 139.

F. gaudeloupensis, Antilles, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 405, pl. vii, fig. 11, n. sp.

Dirrhagus ferrugineus, Caucasus, REITTER, p. 282, Deutsche e. Z. 1889, n. sp.

Tachynemis delauneyi, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 406, n. sp.

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[Cf. BLACKBURN (74), BLANCHARD (78), BUYSSON (121), CANDÈZE (126, 127), FAIRMAIRE (236), FLEUTIAUX (276), FLEUTIAUX & SALLÉ (277), FRIVALDSZKY (291), HEYDEN (376), KOENIG (460), KOLBE (465), REITTER (672, 677, 697), WIELOWIEJSKI (927).]

Agrypnus aqualis, Cand., = (*punctatus* and *mæstus*, Cand.); FLEUTIAUX, Ann. Soc. Ent. Fr. 1889, p. 138.

A. bradshawi, Zambesi, *badeni*, Cameroons, *peringueyi*, Natal, p. 68, *parallelcollis*, Kordofan, *longicollis*, *pumilus*, Abyssinia, *tippooi*, E. India, p. 69, CANDÈZE, Ann. Ent. Belg. xxxiii, n. spp.

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Meristhus perraudierei, Annam, FLEUTIAUX, Ann. Soc. Ent. Fr. (6) ix, p. 139, n. sp.

Tilotarsus armatus, *pulvereus*, *spinifer*, *gazagnairei*, Madagascar, CANDÈZE, p. 74, Ann. Ent. Belg. xxxiii, n. spp.

Alaus ritsemæ, Sumatra, CANDÈZE, Notes Leyd. Mus. xi, p. 95 ; *A. crucifer*, Angola, *antinorii*, Abyssinia, p. 75, *macari*, Centr. Africa, *tristis*, 1889. [VOL. XXVI.]

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Lycoreus corpulentus, Madagascar, CANDÈZE, Ann. Ent. Belg. xxxiii, p. 77, n. sp.

Hemirhipus elegantissimus n. var. *hougeti* ; CANDÈZE, Ann. Ent. Belg. xxxiii, p. 78.

Chalcolepidius rostaynei, New Grenada, *scitus*, Venezuela, p. 78, *exquisita*, Veragua, *juani*, Guatemala, p. 79, *mucronatus*, Colombia, p. 80, CANDÈZE, Ann. Ent. Belg. xxxiii, n. spp.

Semiotus dohrni, Panama, *macer*, Colombia, p. 80, *limatus*, Amazonas, *hispidus*, Venezuela, *ligatus*, *pectitus*, p. 81, *pulchellus*, p. 82, Colombia, CANDÈZE, Ann. Ent. Belg. xxxiii, n. spp.

Campsosternus brunneicornis, Darjiling, CANDÈZE, Ann. Ent. Belg. xxxiii, p. 82, n. sp.

Tetralobus australasiae, Gory, characters, variation, synonymy ; BLACKBURN, pp. 1416-1419, P. Linn. Soc. N.S.W. (2) iii.

T. striatus, p. 82, *macari*, *sobrinus*, Trop. Africa, *grandidieri*, p. 83, *insularis*, p. 84, Madagascar, CANDÈZE, Ann. Ent. Belg. xxxiii, n. spp.

Psephus invenustus, Trop. Africa, CANDÈZE, Notes Leyd. Mus. xi, p. 96 ; *P. capillatus*, Guinea, *solidus*, *antennatus*, p. 84, *semicastaneus*, Niam-Niam, *stanleyi*, Congo, *nigritus*, Cape, *semiflavus*, Guinea, p. 85, *bicolor*, Cape, *bradshawi*, *vulneratus*, Caffraria, p. 86, *valens*, Zanzibar, p. 87, CANDÈZE, Ann. Ent. Belg. xxxiii : n. spp.

Olophæus gibbus, Cand., ♂ noticed ; KOLBE, S. E. Z. 1, p. 126.

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Crepidius brunneus, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 408, n. sp.

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Dicrepidius ignotus, p. 409, *elegans*, p. 410, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, n. spp.

Pachyderes minor, Malacca, p. 88, *bengalensis*, India, p. 89, CANDÈZE, Ann. Ent. Belg. xxxiii, n. spp.

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Monocrepidius delauneyi, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 411 ; *M. tepperi*, p. 1419, *juvenis*, p. 1420, *palmeri*, p. 1421, *fortis*, *variegatus*, p. 1422, S. Australia, BLACKBURN, P. Linn. Soc. N.S.W. (2) iii ; *M. sinuata*, Mexico, *azare*, Paraguay, *ingenuus*, Uruguay, *quadriplagiatus*, Brazil, p. 91, *nubeculosus*, Ecuador, *murinus*, Brazil, *peninsularis*, Florida, *coangustatus*, Padang, p. 92, *ornatus*, Bengal, p. 93, CANDÈZE, Ann. Ent. Belg. xxxiii : n. spp.

Eolus biellipticus, Syria, BUYSSON, p. cxxiii, Bull. Soc. Ent. Fr. (6) ix; *E. opacus*, *apularis*, *suturellus*, p. 93, *bicolor*, Amazons, *rodriguezi*, Guatemala, *cribratus*, Brazil, *mnizechi*, New Grenada, p. 94, *rubripennis*, Amazons, p. 95, CANDÈZE, Ann. Ent. Belg. xxxiii : n. spp.

Heteroderes carinatus, S. Australia, BLACKBURN, p. 1423, P. Linn. Soc. N.S.W. (2) iii; *H. turkomanus*, Taschkent, *spissus*, Abyssinia, *variolus*, Congo, p. 95, *pulchellus*, *zebratus*, Cape, *luteipes*, Hindostan, *heterostirius*, Guatemala, p. 96, *latus*, Florida, p. 97, CANDÈZE, Ann. Ent. Belg. xxxiii : n. spp.

Physorhinus cephalicus, Mexico, CANDÈZE, Ann. Ent. Belg. xxxiii, p. 97, n. sp.

Anchastus saucius, Borneo, p. 97, *luminatus*, Shoa, *syllanus*, morio, Madagascar, *quadriraculatus*, Brazil, *unitinctus*, p. 98, *aloper*, p. 99, Amazons, CANDÈZE, Ann. Ent. Belg. xxxiii, n. spp.

Drusterius cambodiensis, Cambodia, FLEUTIAUX, Ann. Soc. Ent. Fr. (6) ix, p. 141; *D. capensis*, Cape, *illimitus*, Borneo, *dugesi*, Mexico, CANDÈZE, p. 99, Ann. Ent. Belg. xxxiii : n. spp.

Elater cinnabarinus var. = (*angusticollis*, Heyd.); *strumipennis*, Heyd., is a good species; REITTER, p. 260, Deutsche e. Z. 1889.

E. ganglbaueri, Caucasus, *antonice*, Araxes Valley, p. 113, *maraculus*, Morea, p. 116, REITTER, Ent. Nachr. xv; *E. latiusculus* (= *rubidus*, Reitt., nec Cand.), Siberia, REITTER, p. 260, Deutsche e. Z. 1889; *E. conspurcatus*, Philippines, CANDÈZE, Ann. Ent. Belg. xxxiii, p. 100 : n. spp.

Megapenthes piceus, *vicinus*, Cochinchina, FLEUTIAUX, Ann. Soc. Ent. Fr. (6) ix, p. 142; *M. rugipennis* Sumatra, *secundus*, Borneo, p. 100, *cineurus*, Java, *flavo-notatus*, Brazil, p. 101, CANDÈZE, Ann. Ent. Belg. xxxiii : n. spp.

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Dodecatenus, n. g., p. 102, for *D. staudingeri*, n. sp., Panama, p. 103; CANDÈZE, Ann. Ent. Belg. xxxiii.

Pomachilius filiformis, Ecuador, CANDÈZE, p. 104, Ann. Ent. Belg. xxxiii, n. sp.

Anius, n. g. (*Pomachiliites*), for *A. gracillimus*, n. sp., Chili; CANDÈZE, p. 103, Ann. Ent. Belg. xxxiii.

Cryptohypnus nitidicollis, Central Asia, KOENIG, Hor. Ent. Ross. xxxiii, p. 533; *C. balassogloi*, Turkestan, *hova*, Madagascar, *flavicans*, Melbourne, CANDÈZE, Ann. Ent. Belg. xxxiii, p. 104 : n. spp.

Coptostethus majusculus, *fluvus*, *tenuipes*, Cape, CANDÈZE, Ann. Ent. Belg. xxxiii, p. 105, n. spp.

Cardiophorus : the N. American species revised; BLANCHARD, Tr. Am. Ent. Soc. xvi, pp. 1-27. *C. ebeninus*, Germ., = (*curtulus*, Muls.); BUYSSON, Bull. Soc. Ent. Fr. (6) ix, p. cxlvii.

C. russoi, Turkestan, HEYDEN, p. 328, Deutsche e. Z. 1889; *C. keyserlingi*, *candeei*, Chirchik Turkestan, KOENIG, Hor. Ent. Ross. xxxiii, p. 534; *C. bifusciatus*, p. 8, *coarctatus*, p. 9, *pullus*, p. 10, *gemmifer*, p. 11, *abbreviatus*, p. 13, *angustatus*, p. 14, *novadensis*, p. 17, *crinitus*, p. 21, *pubescens*, p. 22,

carbonatus, p. 23, *seniculus*, *dispar*, p. 25, N. America, BLANCHARD, Tr. Am. Ent. Soc. xvi ; *C. henoni*, Madagascar, p. 105, *mus*, Siberia, *granarius*, China, *dohrni*, Ceylon, *liguipennis*, Philippines, *bradshawi*, Zambesi, p. 106, *guttifer*, *cruciatus*, *scriptus*, Madagascar, *assessor*, p. 107, *scutellaris*, *hilaris*, Congo, *jocularius*, *funebria*, p. 108, *abyssinus*, *munitus*, *amari*, *paternus*, *culciarius*, p. 109, *catulus*, *commotus*, Abyssinia, *dahuricus*, Dauria, *vezilarius*, W. Siberia, CANDÈZE, Ann. Ent. Belg. xxxiii : n. spp.

Cardiotarsus punctatus, Madagascar, CANDÈZE, Ann. Ent. Belg. xxxiii, p. 111, n. sp.

Dichromychus puerulus, Zanzibar, CANDÈZE, Ann. Ent. Belg. xxxiii, p. 87, n. sp.

Tarsalgus thysi, Congo, CANDÈZE, Ann. Ent. Belg. xxxiii, p. 87, n. sp.

Ælius insularis, Andaman Is., CANDÈZE, Ann. Ent. Belg. xxxiii, p. 87, n. sp.

Aptopus brevis, Sinaloa, *pichinchæ*, Ecuador, CANDÈZE, Ann. Ent. Belg. xxxiii, p. 111, n. spp.

Horistonotus brunneus, Mexico, CANDÈZE, Ann. Ent. Belg. xxxiii, p. 111, n. sp.

Melanotus apicalis, Cochin China, FLEUTIAUX, Ann. Soc. Ent. Fr. (6) ix, p. 144 ; *M. madagascariensis*, Madagascar, *insularis*, Andaman Is., *peninsularis*, Florida, *rubicundus*, Guatemala, CANDÈZE, Ann. Ent. Belg. xxxiii, p. 112 : n. spp.

Pyrophorus luscus, Guatemala, CANDÈZE, Ann. Ent. Belg. xxxiii, p. 113, n. sp.

Athous mollis, Karpathians, REITTER, p. 372, Deutsche e. Z. 1889 ; *A. transsylvanicus*, Hungary, FRIVALDSZKY, Term. füzetek. xi, p. 160 ; *A. senaci*, p. cci, *propinquus*, p. ccv, *hemus*, p. cci, Turkey, BUYSSON, Bull. Soc. Ent. Fr. (6) ix : n. spp.

Corymbites divaricatus and *crassus* are the sexes of one species ; BLANCHARD, Ent. Am. v, p. 140. *C. hieroglyphicus*, Say, structure of epipharynx ; PACKARD, Psyche, v, p. 227.

C. (Diacanthus) przewalskyi, p. 535, *obscuræneus*, *ssemenovi*, p. 536, *roborowskyi*, p. 538, Amdo, KOENIG, Hor. Ent. Ross. xxiii ; *C. anconicans*, China, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 33 ; *C. famelicus*, Himalaya, p. 113, *orientalis*, Japan, *speculifer*, Yunnan, *bengalensis*, Bengal, *plorator*, Turkestan, p. 114, *violaceus*, Armenia, *peringueyi*, Caffraria, p. 115, *longus*, *piceiventris*, S. Africa, *truculentus*, *uvostigma*, p. 116, *gracilis*, California, *floridanus*, Florida, p. 117, CANDÈZE, Ann. Ent. Belg. xxxiii : n. spp.

Crepidomenus lansbergei, Australia, p. 117, *specularis*, Tasmania, p. 118, CANDÈZE, Ann. Ent. Belg. xxxiii, n. spp.

Asaphes lecontei, California, CANDÈZE, Ann. Ent. Belg. xxxiii, p. 118, n. sp.

Cardiorhinus latipennis, Brazil, CANDÈZE, Ann. Ent. Belg. xxxiii, p. 118, n. sp.

Tomocephalus abdominalis, Chiriqui, CANDÈZE, Ann. Ent. Belg. xxxiii, p. 119, n. sp.

Ludius rubiginosus, Sumatra, CANDÈZE, Notes Leyd. Mus. xi, p. 96 ;

- L. suturalis*, *spissus*, Borneo, CANDÈZE, Ann. Ent. Belg. xxxiii, p. 119 : n. spp.
- Aphanobius gracilis*, Cochin China, *thoracicus*, Zanzuebar, CANDÈZE, p. 119, Ann. Ent. Belg. xxxiii, n. spp.
- Anilicus hemorrhoidalis*, Australia, CANDÈZE, Ann. Ent. Belg. xxxiii, p. 120, n. sp.
- Monelasmus insularis*, Martinique, CANDÈZE, Ann. Ent. Belg. xxxiii, p. 120, n. sp.
- Cosmesus punctum*, *nigrans*, Ecuador, CANDÈZE, p. 120, Ann. Ent. Belg. xxxiii, n. spp.
- Agriotes flavobasalis*, Portugal, HEYDEN, p. 328, Deutsche e. Z. 1889 ; *A. unicolor*, Chinese Turkistan, KOENIG, Hor. Ent. Ross. xxiii, p. 538 ; *A. bonnairei*, Algeria, BUYSSON, p. ccxiv, Bull. Soc. Ent. Fr. (6) ix : n. spp.
- Agonischius thoracicus*, Cochin China, FLEUTIAUX, Ann. Soc. Ent. Fr. (6) ix, p. 145 ; *A. speculifer*, Yunnan, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 34 ; *A. altus*, Darjiling, p. 120, *virgulatus*, *semiluteus*, Borneo, *religiosus*, *decoratus*, Cochin China, p. 121, *ventosus*, Australia, p. 122, CANDÈZE, Ann. Ent. Belg. xxxiii : n. spp.
- Sericus behrensi*, California, CANDÈZE, Ann. Ent. Belg. xxxiii, p. 122, n. sp.
- Acroniopus pallidus*, S. Australia, BLACKBURN, p. 1423, P. Linn. Soc. N.S.W. (2) iii, n. sp.
- Glyphonyx semipunctatus*, Bengal, CANDÈZE, Ann. Ent. Belg. xxxiii, p. 122, n. sp.
- Silesis cordubensis* and allies, characters of ; BUYSSON, Rev. d'Ent. viii, pp. 211 & 212.
- S. bengalensis*, India, CANDÈZE, Ann. Ent. Belg. xxxiii, p. 122, n. sp.
- Ctenoplus collaris*, Sumatra, CANDÈZE, Ann. Ent. Belg. xxxiii, p. 123, n. sp.
- Campylus denticornis*, Kir., structure of epipharynx ; PACKARD, Psyche, v, p. 227.
- C. davidis*, Moupin, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 34, n. sp.
- Parhemiops dubius*, Cochin China, FLEUTIAUX, Ann. Soc. Ent. Fr. (6) ix, p. 145, n. sp.
- Octinodes æquatorius*, Ecuador, CANDÈZE, Ann. Ent. Belg. xxxiii, p. 123, n. sp.
- Hemiopinus metallicus* (no locality) ; CANDÈZE, Ann. Ent. Belg. xxxiii, p. 123, n. sp.

CEBRIONIDÆ, DASCILLIDÆ.

- [Cf. FAIRMAIRE (236), HEYDEN (380), KIRSCH (455), REITTER (672).]
Cebrio bicolor, Fab., habits ; LINTNER, Rep. N. Y. Mus. xl, p. 100.
Artematopus obesus, pl. i, fig. 6, *hirtus*, *obscurus*, p. 4, *bogotanus*, *conicollis*, p. 5, Colombia and Ecuador, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, n. spp.
Ptilodactyla variegata, Colombia, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 5, pl. i, fig. 7, n. sp.

Dasyllus maculosus, Moupin, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) viii, p. 35 ; *D. mongolicus*, Kan-ssu, HEYDEN, p. 675, Hor. Ent. Ross. xxiii : n. spp.

Microcara caspica, Lenkoran, REITTER, p. 372, Deutsche e. Z. 1889, n. sp.

TELEPHORIDÆ (MALACODERMIDÆ).

[*Cf.* BERG (51), BERGROTH (60), BLACKBURN (74), BOURGEOIS (93, 94, 380), DESBROCHERS (181), EXNER (234), FAIRMAIRE (236, 240), FLEUTIAUX & SALLÉ (277), GORHAM (326), HEYDEN (380), KIRSCH (455), OLLIFF (610), REITTER (672, 676, 683, 684), RITSEMA (728), WIELOWIEJSKI (926).]

Lycides.

Lycostomus moupinensis, Moupin, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 36, n. sp.

Lycus præmorsus, p. 237, *elegans*, p. 238, *sinuatus*, p. 239, varieties described ; BOURGEOIS, Ann. Soc. Ent. Fr. (6) ix. *L. apicalis*, Th., = (*seminiger*, Kolbe), *haagi*, ♂ described, *trabeatus*, Guer., var., = (*vallois*, Gerst.), p. 225, *bucolicus*, Gorh., variation noticed, p. 230 ; BOURGEOIS, Ann. Soc. Ent. Fr. (6) ix.

L. alluaudi, p. 238, *simplex*, p. 240, W. Africa, BOURGEOIS, Ann. Soc. Ent. Fr. (6) ix ; *L. kolbei*, *integripennis*, Transvaal, p. 226, *excisellus*, p. 227, *L. (Lycostomus) dalmani*, W. Africa, p. 228, *L. (Thoracocalon) icarus*, S. America, p. 229, BOURGEOIS, Ann. Soc. Ent. Fr. (6) ix : n. spp.

Lygistopterus assiniensis, W. Africa, BOURGEOIS, Ann. Soc. Ent. Fr. (6) ix, p. 240, n. sp.

Cautires grandipennis, Madagascar, FAIRMAIRE, C.R. ent. Belg. xxxiii, p. viii ; *C. dichrocerus*, p. 241, *macer*, *unicolor*, p. 242, *infutellus*, p. 243, *latithorax*, p. 244, W. Africa, BOURGEOIS, Ann. Soc. Ent. Fr. (6) ix : n. spp.

Xylobanus xanthomerus, *pentagonus*, W. Africa, BOURGEOIS, p. 245, Ann. Soc. Ent. Fr. (6) ix, n. spp.

Adocetus dregei, Cape Good Hope, BOURGEOIS, Ann. Soc. Ent. Fr. (3) ix, p. 230, n. sp.

Porrostoma melaspis, Australia, BOURGEOIS, Ann. Soc. Ent. Fr. (6) ix, p. 235, n. sp.

Stadenus dichrous, Wat., ♂ described ; BOURGEOIS, Ann. Soc. Ent. Fr. (6) ix, p. 235.

S. antennalis, W. Africa, BOURGEOIS, Ann. Soc. Ent. Fr. (6) ix, p. 246, n. sp.

Culopteron interventionis, Tucuman, BERG, p. 151, An. Un. B. Aires, vi : *C. geminum*, p. 231, *laticolle*, p. 232, *scenicum*, p. 233, S. America, BOURGEOIS, Ann. Soc. Ent. Fr. (6) ix : n. spp.

Plateros sordidus, China, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 36 ; *P. scutellaris*, Colombia, BOURGEOIS, Ann. Soc. Ent. Fr. (6) ix, p. 234 : n. spp.

Metriorrhynchus luteobrunneus, Amboyca, BOURGEOIS, Ann. Soc. Ent. Fr. (6) ix, p. 236, n. sp.

Lyponia ? *brevicollis*, Moupin, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 37, n. sp.

Cænna scapularis, Newm., variation described ; BOURGEOIS, Ann. Soc. Ent. Fr. (6) ix, p. 234.

Calochromus quadraticollis, N. China, BOURGEOIS, p. 672, Hor. Ent. Ross. xxiii, n. sp.

Euanoma, n. g., near *Homalisus*, p. 98, for *E. starcki*, n. sp., Circassia, p. 99 ; REITTER, Wien. ent. Z. viii.

Lampyrides.

Lucidota punctata, Lec., structure of epipharynx ; PACKARD, Psyche, v, p. 226.

L. carinicollis, *cruenticollis*, China, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 38, n. spp.

Photinus collustrans, ♀ described ; SCHWARZ, P. E. Soc. Washington, i, p. 176.

Lampyris, sexual distinctions in larvæ of ; BOURGEOIS, Bull. Soc. Ent. Fr. (6) ix, p. cxiv. *L. splendidula*, structure and function of eye ; EXNER (234).

Pyrocælia moupincensis, China, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 37, n. sp.

Luciola limbalis, p. 38, *antica*, p. 39, China, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, n. spp.

Photuris angusta, Bolivia, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 6, pl. i, fig. 9, n. sp.

Telephorides, Driiides.

Podabrus semifumatus, p. 39, *ænescens*, *dimidiaticrus*, p. 40, China, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, n. spp.

Daiphron gorhami, pl. i, fig. 11, p. 7, *polemioides*, fig. 12, *morio*, p. 8, Colombia and Ecuador, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, n. spp.

Chauliognathus missionum, p. 147, *maschalostictus*, p. 148, *saltator*, p. 150, Argentine Rep., BERG, An. Un. B. Aires, vi ; *C. rugipennis*, *rufo-fasciatus*, pl. i, fig. 10, p. 6, *cordilleræ*, *occipitalis*, p. 7, Ecuador and Bolivia, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4 : n. spp.

Telephorus rotundicollis, Say, structure of epipharynx ; PACKARD, Psyche, v, p. 226.

T. atrifrons, p. 40, *coriaceipennis*, *dimidiaticrus*, p. 41, *dauidis*, p. 42, *rugoso-cyaneus*, p. 43, China, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix ; *Cantharis* (*Telephorus*) *brunneipennis*, p. 673, *C. pubicollis*, p. 674, *plagiata*, p. 675, China, HEYDEN, Hor. Ent. Ross. xxiii ; *T. apterus*, Lord Howe I., OLLIFF, p. 84, pl. vi, fig. 3, Lord Howe Island ; *T. tepperi*, p. 1424, *palmerstoni*, p. 1425, S. Australia, BLACKBURN, P. Linn. Soc. N.S.W. (2) iii ; *T. (Cantharis) exsiccollis*, Buenos Ayres, BERG, p. 146, An. Un. B. Aires, vi ; *T. carinellus*, p. 8, *æquatorialis*, pl. i, fig. 13, *cæruleipennis*, fig. 14, *brevicollis*, fig. 15, *alticola*, fig. 16, p. 9, Colombia and Ecuador, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4 ; *T. maculicornis*, *cinctipennis*, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 416 ; *T. chaly-*

bcipennis, p. 96, pl. x, fig. 2, *khasianus*, fig. 1, *versicolor*, p. 97, *brahminicus*, *cruralis*, *viator*, p. 98, *semiustus*, *stygianus*, p. 99, *semifuleus*, *manducatus*, *huddi*, p. 100, India, *insularis*, Andaman Is., pl. x, fig. 6, *nicobarianus*, Nicobars, *bieti*, p. 101, fig. 5, *thibetanus*, *oberthueri*, Thibet, *imperialis*, Kiukiang, fig. 8, p. 102, *nobilis*, fig. 9, *regalis*, p. 103, *leechianus*, with var. *aneipennis*, *coelestis*, fig. 7, p. 104, *violaceipennis*, *T. (Ancistronycha) pratianus*, fig. 3, *orientalis*, p. 105, *bartoni*, *T. sinensis*, p. 106, *kiukianganus*, *purpurcipennis*, fig. 4, *metallescens*, p. 107, *T. ? flavicornis*, p. 108, China, GORHAM, P. Z. S. 1889 : n. spp.

Lycocerus, n. g., p. 108, for *L. serricornis*, pl. x, fig. 10, *lateritius*, *decipiens*, p. 109, *caliginosus*, fig. 11, India, *militaris*, fig. 12, China, p. 110, n. spp. ; GORHAM, P. Z. S. 1889.

Silis pallidicentris, Moupin, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 36, n. sp.

Ichthyurus, list of the species of ; RITSEMA, Notes Leyd. Mus. xi, pp. 159 & 160.

Lobetus guadeloupensis, Antilles, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 417, n. sp.

Malthinus novaki, I. of Lesina, REITTER, p. 373, Deutsche e. Z. 1889, n. sp.

Malthodes ordubadensis, Araxes Valley, REITTER, p. 24, Deutsche e. Z. 1889 ; *M. ligulifer*, California, BERGROTH, Bull. Soc. Ent. Fr. (6) ix, p. cciii : n. spp.

Podistra circassicola, Circassia, REITTER, p. 100, Wien. ent. Z. viii, n. sp. *Malchinus circassicus*, Circassia, *pseudorhagonycha*, Corfu, p. 67, *gibbiceps*, Lenkoran, p. 68, REITTER, Wien. ent. Z. viii, n. spp.

Drilus flavescens, sexual distinctions in larvæ ; DESMAREST, Bull. Soc. Ent. Fr. (6) ix, p. cxv.

Melyridæ.

Laius variegatus, *major*, S. Australia, BLACKBURN, p. 1426, P. Linn. Soc. N.S.W. (2) iii, n. spp.

Malachius bicornutus, p. 43, *strigigerus*, p. 44, China, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, n. spp.

Anthocomus huile, Colombia, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 10, pl. i, fig. 17, n. sp.

Psilothrix protensus n. var. *busambrensis* ; RAGUSA, Nat. Sicil. viii, p. 236.

Julistus fulvopilis, Ordubad, REITTER, p. 25, Deutsche e. Z. 1889, n. sp.

Amauronia longula, Algeria, DESBROCHERS, Bull. Soc. Ent. Fr. (6) ix, p. clxxxv, n. sp.

Haplamaurus marginipennis, pl. i, fig. 18, *suturalis*, fig. 19, Colombia, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 10, n. spp.

Dasytiscus rufotestaceus, Algeria, REITTER, p. 373, Deutsche e. Z. 1889 ; *D. flaveolus*, Rhodes, REITTER, p. 257, Deutsche e. Z. 1889 ; *D. ancolus*, *ruficollis*, Araxes Valley, p. 25, *fausti*, Taschkent, p. 26, REITTER, Deutsche e. Z. 1889 : n. spp.

Cerallus pilosus, *flavipennis*, Ordubad, REITTER, p. 283, Deutsche e. Z. 1889, n. spp.

Danacea plumbea, luctuosa, Algeria, DESBROCHERS, Bull. Soc. Ent. Fr. (6) ix, p. clxxxv, n. spp.

Astylus rubricosta, Cordoba, BERG, p. 145, An. Uu. B. Aires, vi; *A. scarguttatus*, pl. i, fig. 20, *bourgeoisii*, fig. 21, *pallipes*, fig. 22, Colombia, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 11 : n. spp.

Idgia moupinensis, China, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 44, n. sp.

CLERIDÆ.

[Cf. BLACKBURN (74), FAIRMAIRE (240, 242), KIRSCH (454).]

Pallenis pleuralis, Madagascar, FAIRMAIRE, C.R. ent. Belg. xxxiii, p. viii; *P. apicalis, digraphis*, Madagascar, FAIRMAIRE, C.R. ent. Belg. xxxiii, p. xci : n. spp.

Stenocylidrus strangulatus, Madagascar, FAIRMAIRE, C.R. ent. Belg. xxxiii, p. xci, n. sp.

Tilloderus testaceipes, Madagascar, FAIRMAIRE, C.R. ent. Belg. xxxiii, p. xci, n. sp.

Cymatodera gracilis, Colombia, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 12, pl. i, fig. 23, n. sp.

Opilo tenuatus, KL., = (*Tillus rubrofasciatus*, Kol.); HEYDEN, p. 202, Wien. ent. Z. viii.

O. dorsoplagiatus, coronatus, marmoreus, Madagascar, FAIRMAIRE, C.R. ent. Belg. xxxiii, p. xci, n. spp.

Lissaulicus geniculatus, compressicollis, Madagascar, FAIRMAIRE, C.R. ent. Belg. xxxiii, p. xcii, n. spp.

Cteniopachys, n. g., near *Cladiscus*, for *C. tenebrosus*, n. sp., Madagascar; FAIRMAIRE, C.R. ent. Belg. xxxiii, p. xcii.

Cleropiestus, n. g., for *C. oberthurii*, n. sp., Madagascar; FAIRMAIRE, C.R. ent. Belg. xxxiii, p. xcii. (No family or ally is mentioned, and the genus is placed by the recorder in *Cleridæ* merely on account of the name.)

Nutalis semicostata, S. Australia, BLACKBURN, p. 1427, P. Linn. Soc. N.S.W. (2) iii, n. sp.

Clerus nigripes, Say, structure of epipharynx; PACKARD, Psyche, v, p. 226.

Coryneles fimetarius, Woll., occurrence of in Tripolis; QUEDENFELDT, Ent. Nachr. xv, p. 319.

LYMEXYLONIDÆ, PTINIDÆ, BOSTRICHIDÆ.

[Cf. BLACKBURN (74), DESBROCHERS (181), FAIRMAIRE (236), KIRSCH (455), KOLBE (466), OLLIFF (610, 612), REITTER (672).]

Hylecetus cribricollis, Moupin, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 45; *H. pervagus*, Lord Howe I., OLLIFF, p. 85, Lord Howe Island : n. spp.

Trigonogenius tropicus, Ecuador, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 12, n. sp.

Sphericus gibbioides, a pest in herbaria; SCHWARZ, P. E. Soc. Washington, i, p. 174.

Niptus hololeucus, appearance and distribution of in Europe; KOLBE (466): note on its introduction; WESTHOFF, J. Ber. westf. Ver. 1886, p. 63.

Sitodrepa panicea injurious to leather; LINTNER, 4th Rep. pp. 88-91
Anobium paniceum injurious to boots; ORMEROD, Inj. ins. S. Afr. pp. 14-17.

Plumaria, n. g., for *Ptilinus grandicollis*, Mén.; REITTER, p. 127, Wien. ent. Z. viii.

Xyletinus pectinifer, Fairm., = (*pruinus*, Desb.); FAIRMAIRE, Bull. Soc. Ent. Fr. (6) ix, p. cccxi.

X. pruinus, Algeria, DESBROCHERS, Bull. S. c. Ent. Fr. (6) ix, p. clxxxvi, n. sp. (See above.)

Lasioderma serricorne destroying plush furniture; COOK, Canad. Ent. xxi, p. 187.

Theca xyletina, Ordubad, REITTER, p. 283, Deutsche e. Z. 1889, n. sp.

Dorcatoma lanigera, N. S. Wales, OLLIFF, p. 1511, P. Linn. Soc. N.S.W. (2) iii, n. sp.

Cenophrada anobioides, Wat., figured; WATERHOUSE, Aid, pl. clxxxi. fig. 7.

Sinoxylon: notes on; SCHWARZ, P. E. Soc. Washington, i, p. 177.

Apatodes, n. g., for *A. macleayi*, n. sp., S. Australia; BLACKBURN, p. 1429, P. Linn. Soc. N.S.W. (2) iii.

TENEBRIONIDÆ.

[Cf. BALLION (24), BERG (51), BLACKBURN (74), CASEY (138), DESBROCHERS (181), FAIRMAIRE (236, 240, 241), FLEUTIAUX & SALLÉ (277), GILSON (317, 318), KOLBE (465), MARSEUL (550), NEVINSON (597), OATES (608), OLLIFF (610), QUEDENFELDT (650, 651), REITTER (672, 701), SÉMENOW (797), SÉNAC (803), STARCK (842), WATERHOUSE (1).]

Zophosides to Epitragides.

Arthrodeis intermedius, Perewellnaja, REITTER, p. 27, Deutsche e. Z. 1889, n. sp.

Spyrathus politus, Afghanistan, WATERHOUSE, Tr. L. S. (2) v, p. 124, pl. xiv, fig. 1, n. sp.

Adesmia sodalis, Baluchistan, WATERHOUSE, Tr. L. S. (2) v, p. 125, pl. xiv, figs. 2 & 3, n. sp.

Tricentoma guadeloupensis, Antilles, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 421, n. sp.

Edrotes nitidus, globosus, N. America, CASEY, Ann. N. York Ac. v, p. 175, n. spp.

Capnisa fausti, n. n. for *C. modesta*, Faust; REITTER, p. 29, Deutsche e. Z. 1889.

C. skobelowi, Achal-Tekke, STARCK, p. 53, Wien. ent. Z. viii, n. sp.

Anatolica extrema, Shan-si, p. 679, *pandarooides*, Kan-ssu, *semenowii*, p. 680, *immarginata, sternalis*, p. 681, *mucronata*, Kan-ssu, *suturalis*, Mongolia, p. 682, *annulata, potanini*, Ordos, p. 683, REITTER, Hor. Ent. Ross. xxiii, n. spp.

Calyptopsis emarginata, Talysch, p. 28, *antonici*, Araxes Valley, p. 29, REITTER, Deutsche e. Z. 1889, n. spp.

Scythis opaca, Mongolia, REITTER, p. 684, Hor. Ent. Ross. xxiii, n. sp.

Dordanea kraatzi, Mongolia, p. 685, *aurita*, Kan-szu, *mongolica*, Mongolia, p. 686, REITTER, Hor. Ent. Ross. xxiii, n. spp.

Microdera subseriata, Kan-szu, REITTER, p. 686, Hor. Ent. Ross. xxiii, n. sp.

Megulophrys (Peltolobus) desertorum, Patagonia, BERG, p. 143, An. Un. B. Aires, vi, n. sp.

Sphenaria, synonymy of recently described species of; SÉMENOW, p. 310, Wien. ent. Z. viii.

S. glabra, suturalis, olgae, Transcaspiian region, SÉMENOW, p. 309, Wien. ent. Z. viii, n. spp.

Asphena antonovi, Transcaspiian region, SÉMENOW, p. 310, Wien. ent. Z. viii, n. sp.

Zopherides, Stenosides, Leptodides.

Nosoderma dormeanum, Brazil, FAIRMAIRE, C.R. ent. Belg. xxxiii, p. xxxii, n. sp.

Usechus nucleatus, California, CASEY, Ann. N. York Ac. v, p. 176, n. sp.

Eutagenia syriaca, Syria, p. 284, *hellenica*, Greece, *turcomana*, Turcomania, *egyptiaca*, Alexandria, p. 285, REITTER, Deutsche e. Z. 1889, n. spp.

Hidrosis elongatula, Tripolis, QUEDENFELDT, B. E. Z. xxxiii, p. 395, n. sp.

Stenosis pilosa, Motsch., note on characters and synonymy; REITTER, p. 30, Deutsche e. Z. 1889.

Dichillus araxidis, Araxes Valley, REITTER, p. 30, Deutsche e. Z. 1889, n. sp.

Leptodes lederi, Araxes Valley, REITTER, p. 32, Deutsche e. Z. 1889; *L. sulcicollis*, Kan-szu, REITTER, p. 687, Hor. Ent. Ross. xxiii, n. spp.

Akisides, Scaurides, Blaptides.

Akis richteri, Tripolis, QUEDENFELDT, Ent. Nachr. xv, p. 354, n. sp.

Scaurus asperulus, Fairm., = (*kraatzi*, Haag); HEYDEN, p. 294, Wien. ent. Z. viii.

Scotobius hystricosus, Cordoba, BERG, p. 134, An. Un. B. Aires, vi, n. sp.

Leptynoderes laticollis, Catamarca, BERG, p. 135, An. Un. B. Aires, vi, n. sp.

Blaps mortisaga, odoriferous apparatus of; GILSON (317, 318). *B. supersticiosa*, Er., *verrucosa*, Ad., *teniolata*, Men., *producta*, Br., *indagator*, Reiche, *muricata*, Fisch., *vicina*, Mann., *tenuicollis*, Sol., synonymy of discussed at length; BALLION, Bull. Mosc. (n.s.) ii, pp. 694-703.

B. tridentata, p. 125, pl. xiv, fig. 9, *felix*, p. 126, pl. xiv, fig. 12, Afghanistan, WATERHOUSE, Tr. L. S. (2) v; *B. pudica*, Syria, *tenuicollis*, Caucasus, BALLION, p. 704, Bull. Mosc. (n.s.) ii : n. spp.

Platyblaps latericosta, Kan-szu, REITTER, Hor. Ent. Ross. xxiii, p. 688, n. sp.

Blapimorpha gressoria, p. 689, *potanini*, p. 690, *opaca*, p. 691, Kan-ssu, REITTER, Hor. Ent. Ross. xxiii, n. spp.

Leptocolena allardiana, Kan-ssu, REITTER, Hor. Ent. Ross. xxiii, p. 692, n. sp.

Tagonoides, Fairm., = (*Gnaptorina*, Reitt.); FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 45.

Gnaptorina, Reitt., and *Tagonoides*, Fairm., are the same genus, and the former name should be used, though the latter has priority; REITTER, p. 692, Hor. Ent. Ross. xxiii.

G. cylindricollis, p. 693, *potanini*, *proxima*, p. 694, Kan-ssu, REITTER, Hor. Ent. Ross. xxiii, n. spp.

Itagonia semenowi, Kan-ssu, REITTER, p. 694, Hor. Ent. Ross. xxiii, n. sp.

Asidoblaps, Fairm., and *Itagonia*, Reitt., queried as identical; FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 45.

Acanthoblaps dentitibia, Kan-ssu, REITTER, Hor. Ent. Ross. xxiii, p. 687, n. sp.

Prosodes costifera, Kr., and *fallax*, Kr., note on distinctions of; HEYDEN, p. 332, Deutsche e. Z. 1889.

P. diversa, Afghanistan, WATERHOUSE, Tr. L. S. (2) v, p. 126, pl. xiv, figs. 10 & 11, n. sp.

Eleodes obsoleta, Say, structure of epipharynx; PACKARD, Psyche, v, p. 225.

Asidides, *Nycteliides*, *Pimeliides*.

Asida nigro-opaca, Tripolis, QUEDENFELDT, B. E. Z. xxxiii, p. 398, n. sp.
Cardiogenius porculus, Tandil, BERG, p. 133, An. Un. B. Aires, vi, n. sp.

Scotinus biphicatus, p. xxxii, *parvicollis*, p. xxxiii, Minas Geraes, FAIRMAIRE, C.R. ent. Belg. xxxiii, n. spp.

Nyctelia cicatriculata, p. 130, *garciae*, p. 132, Argentine Rep., BERG, An. Un. B. Aires, vi, n. spp.

Mitrigenius monticola, p. 128, *nudus*, p. 129, S. America, BERG, An. Un. B. Aires, vi, n. spp.

Platyope planidorsis, Turcomania, REITTER, p. 285, Deutsche e. Z. 1889, n. sp.

Mantichorula, n. g., near *Platyope*, for *M. semenowi*, n. sp., Kan-ssu, REITTER, p. 695, Hor. Ent. Ross. xxiii.

Trigonoscelis longipes, Baluchistan, WATERHOUSE, p. 128, pl. xiv, fig. 5, Tr. L. S. (2) v; *T. mongolica*, Mongolia, p. 696, *pseudopimelia*, Kan-ssu, p. 697, REITTER, Hor. Ent. Ross. xxiii: n. spp.

Diesia costifera, Baluchistan, WATERHOUSE, Tr. L. S. (2) v, p. 127, pl. xiv, fig. 13, n. sp.

Lasiostola gemmata, Ashkhabad, REITTER, p. 286, Deutsche e. Z. 1889, n. sp.

Ocnera gracilis, Afghanistan, WATERHOUSE, Tr. L. S. (2) v, p. 127, pl. xiv, fig. 8, n. sp.

Pimelia, monograph of; SÉNAC (803).

P. thomsoni, Atlas mountains, NEVINSON, Ent. M. M. xxv, p. 255; *P.*

bicostatus, Siberia, pt. i, p. 3, *nilotica*, Egypt, p. 27, *prophetei*, Algeria, p. 63, *gestroi*, Persia, p. 94, *kraatzii*, Mesopotamia, pt. ii, p. 17, *hirtella*, Egypt, p. 47, *bottæ*, p. 48, *murseuli*, p. 50, Arabia, *perezi*, Spain, p. 69, *villanovæ*, Grenada, p. 78, SÉNAC, Ess. Mon. Pimelia : n. spp.

Sympiezocnemis and *Urielina*, Reitter; note on these genera, with suggestion that *U. nitida*, Reitt., is distinct from *Podhomala nitida*, Bandi : REITTER, pp. 261-263, Deutsche o. Z. 1889.

Pachylodera, n. g., p. 399, for *P. brevicornis*, n. sp., Tripolis, p. 400; QUEDENFELDT, B. E. Z. xxxiii.

Leucocephus tripolicinus, N. Africa, QUEDENFELDT, Ent. Nachr. xv, p. 353, n. sp.

Molurides to Trachyscelides.

Pnammodes obliquatus, ravages of; ORMEROD, Inj. ins. S. Afr. p. 18.

Praocis sellata, Patagonia, BERG, p. 126, An. Un. B. Aires, vi, n. sp.

Cæloxixis angustula, Guadalupe I., California, CASEY, Ann. N. York Ac. v, p. 177, n. sp.

Cælus ciliatus, larva described; CASEY, Ann. N. York Ac. v, p. 180, woodent.

C. grossus, p. 178, *arenarius*, p. 179, California, CASEY, Ann. N. York Ac. v, n. spp.

Cælomorpha, n. g., p. 182, for *C. maritima*, n. sp., Lower California, p. 183; CASEY, Ann. N. York Ac. v.

Crypticus tenietensis, Algeria, DESBROCHERS, Bull. Soc. Ent. Fr. (6) ix, p. clxxxv; *C. asiaticus*, Mongolia, REITTER, p. 698, Hor. Ent. Ross. xxiii : n. spp.

Platyscelis ballioni, Schan-si, REITTER, p. 698, Hor. Ent. Ross. xxiii, n. sp.

Myladina, n. g. (*Opatrinides*), p. 706, for *M. unguiculina*, *punctifera*, Mongolia, p. 707, *potanini*, Kan-ssu, *ordosana*, Mongolia, p. 708, n. spp.; REITTER, Hor. Ent. Ross. xxiii.

Faustia: tabulation of the species; REITTER, p. 699, Hor. Ent. Ross. xxiii.

F. micans, Kan-ssu, p. 699, *rubripes*, Amdo, p. 700, REITTER, Hor. Ent. Ross. xxiii, n. sp.

Pedinus fulvicornis, Sze-tschuan, REITTER, p. 700, Hor. Ent. Ross. xxiii, n. sp.

Hopatropteron, n. g., *Pedinides*, for *H. subcostatum*, n. sp., Kan-ssu; REITTER, p. 701, Hor. Ent. Ross. xxiii.

Melanesthes: table of described species; REITTER, p. 702, Hor. Ent. Ross. xxiii.

M. opaca, Ordos, *ciliata*, Mongolia, p. 703, *punctipennis*, *rugipennis*, Kan-ssu, p. 704, REITTER, Hor. Ent. Ross. xxiii, n. spp.

Opatrum micans, Germ., ravages of; ORMEROD, Inj. ins. S. Afr. p. 19.

Hopatrum calvulum, Lord Howe I., OLLIFF, p. 85, Lord Howe Island, n. sp.

Gonocephalum curvicolle, Kan-ssu, p. 705, *mongolicum*, Ordos, p. 706, REITTER, Hor. Ent. Ross. xxiii, n. spp.

Scleropatrum breviusculum, Araxes Valley, REITTER, p. 32, Deutsche Z. 1889, n. sp.

Opatroides (Penthius) obtusangulus, Mongolia, REITTER, p. 709, Hor. Ent. Ross. xxiii, n. sp.

Trichoton lapidicola, S. America, FAIRMAIRE, p. xxxiii, C.R. ent. Belg. xxxiii, n. sp.

Ostorius, n. g., near *Leichenium*, p. xxxiii, for *O. multcostatus*, n. sp., Minas Geraes, p. xxxiv; FAIRMAIRE, C.R. ent. Belg. xxxiii.

Phaleria cadaverina, F., description of larva; FOWLER, Ent. M. M. xxv, p. 304.

P. chevolati, p. 422, *fulva, guadeloupensis*, p. 423, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, n. spp.

Diaperides, Ulomides.

Platydemia spicata, Lord Howe I., OLLIFF, p. 85, Lord Howe Island; *P. obscura*, S. Australia, BLACKBURN, p. 1430, P. Linn. Soc. N.S.W. (2) iii: n. spp.

Ulloporus, n. g., near *Platydemia*, p. 184, for *U. ovalis*, n. sp., Texas, p. 185; CASEY, Ann. N. York Ac. v.

Allegoria castelnaui, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 425, n. sp.

Antimachus roudeni, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 426, n. sp.

Arrhabæus guadeloupensis, Antilles, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 424, n. sp.

Eutochia similima, p. xxxiv, *rotundicollis*, p. xxxv, Minas Geraes, FAIRMAIRE, C.R. ent. Belg. xxxiii, n. spp.

Toricum matabelicum, Africa, OLLIFF, in Oates' Matabele Land, ed. ii, p. 376; *T. addendum*, S. Australia, BLACKBURN, p. 1431, P. Linn. Soc. N.S.W. (2) iii: n. spp.

Heleides to Tenebrionides.

Saragus guilelmi, Lord Howe I., OLLIFF, p. 86, Lord Howe Island, n. sp.

Eudustomus coangoanus, costulatus, W. Africa, KOLBE, S. E. Z. 1. p. 127, n. spp.

Hyppaular interioris, p. 1432, *iridescens*, p. 1433, Australia, BLACKBURN, P. Linn. Soc. N.S.W. (2) iii, n. spp.

Nyctobates sterrha, Lord Howe I., OLLIFF, p. 86, pl. vi, fig. 1, Lord Howe Island; *N. cesarati*, Minas Geraes, FAIRMAIRE, C.R. ent. Belg. xxxiii, p. xxxv: n. spp.

Sophrobates, n. g., near *Nyctobates*, for *S. arcadii*, n. sp., Minas Geraes; FAIRMAIRE, C.R. ent. Belg. xxxiii, p. xxxvi.

Oatesius, n. n. for *Derospharrius*, West.; WESTWOOD, in Oates' Matabele Land, ed. ii, p. 376.

Hesiolus carabius, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 424, n. sp.

Meneristes vulgaris, curtulus, Lord Howe I., OLLIFF, pp. 87 & 88, pl. vi, fig. 6, Lord Howe Island, n. spp.

Calophtalmus tenuicornis, p. xxxvi, *postsignatus*, p. xxxvii, Brazil, FAIRMAIRE, C.R. ent. Belg. xxxiii, n. spp.

Boromorphus armeniacus, Araxes Valley, REITTER, p. 33, Deutsche e. Z. 1889, n. sp.

Goniodera noremcostata, Minas Geraes, p. xxxvii, *tuberculifera*, Amazonas, *simplex*, Minas Geraes, p. xxxviii, FAIRMAIRE, C.R. ent. Belg. xxxiii, n. spp.

Heterotarsides to Strongyliides.

Phymatodes sipolisii, Minas Geraes, FAIRMAIRE, C.R. ent. Belg. xxxiii, p. xxxix, n. sp.

Phobelius lucifugus, p. xxxix, *regularis*, Minas Geraes, *nodipennis*, S. America, p. xl, FAIRMAIRE, C.R. ent. Belg. xxxiii, n. spp.

Anædus delauneyi, Gaudeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 428 ; *A. fulvipennis*, p. xl, *oratus*, *claricornis*, p. xli, Brazil, FAIRMAIRE, C.R. ent. Belg. xxxiii : n. spp.

Paratenetus epitragoides, Buenos Ayres, BERG, p. 137, An. Un. B. Aires, vi, n. sp.

Lypros büttneri, W. Africa, KOLBE, S. E. Z. 1, p. 128, n. sp.

Prionocleides, n. g., for *P. rugosus*, n. sp., W. Africa, KOLBE, S. E. Z. 1, p. 128.

Dichastops congoana, W. Africa, KOLBE, S. E. Z. 1, p. 129, n. sp.

Odontopezus, n. n. for *Odontopus*, Silb., nec Læp. ; ALLUAUD, Bull. Soc. Ent. Fr. (6) ix, p. xlv.

Porphyryba grandis, Madagascar, FAIRMAIRE, C.R. ent. Belg. xxxiii, p. viii, n. sp.

Camaria occidentalis, p. 138, *tucumana*, p. 140, Argentine Rep., BERG, An. Un. B. Aires, vi, n. spp.

Acropteron chabrieri, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 429, n. sp.

Laena bifoveolata, Kan-ssu, REITTER, p. 709, Hor. Ent. Ross. xxiii, n. sp.

Helops subæneus, Kan-ssu, REITTER, p. 710, Hor. Ent. Ross. xxiii, n. sp.

Amarygmus diaperioides, S. Australia, BLACKBURN, p. 1435, P. Linn. Soc. N.S.W. (2) iii, n. sp.

Pareupezus, n. g., for *P. glaber*, n. sp., W. Africa ; KOLBE, S. E. Z. 1, p. 129.

Paramarygmus subglobosus, W. Africa, KOLBE, S. E. Z. 1, p. 130, n. sp.

Chalcopterus longiusculus, S. Australia, BLACKBURN, p. 1435, P. Linn. Soc. N.S.W. (2) iii, n. sp.

Plesiophthalmus pallidicrus, Moupin, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 46, n. sp.

Strongylium glabrum, W. Africa, KOLBE, S. E. Z. 1, p. 130 ; *S. delauneyi*, p. 429, *inæquale*, p. 430, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix ; *S. correntinum*, p. 141, *entrierianum*, p. 142, Argentine Rep., BERG, An. Un. B. Aires, vi ; *S. (Pæcilesthus) pallidocinctum*, p. xli, *S. (Særangodes) iodopterum*, *S. æneomicans*, pl. xlii, *filum*, pl. xliii, Minas Geraes, FAIRMAIRE, C.R. ent. Belg. xxxiii : n. spp.

Aspidosternum, Mäkl., is referred to *Pyncoceriides*, and is not distinct from *Metallonotus*, Gray ; ALLUAUD, Bull. Soc. Ent. Fr. (6) ix, p. xlvii.

CISTELIDÆ.

[*Cf.* BERG (51), BLACKBURN (74), FAIRMAIRE (236, 240, 241), FLEUTIAUX & SALLÉ (277), HEYDEN (380), REITTER (676).]

Praogena longipennis, Madagascar, FAIRMAIRE, C.R. ent. Belg. xxxiii. p. viii, n. sp.

Talanus guadeloupensis, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 430, n. sp.

Blepusa dormei, Minas Geraes, FAIRMAIRE, C.R. ent. Belg. xxxiii. p. xliii, n. sp.

Lobopoda tarsalis, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 431, n. sp.

Apellatus palpalis, MacL., note on sexes of; BLACKBURN, p. 1439, P. Linn. Soc. N.S.W. (2) iii.

A. apicalis, W. Australia, BLACKBURN, p. 1440, P. Linn. Soc. N.S.W. (2) iii, n. sp.

Metistete pimelioides, Hope, redescribed; BLACKBURN, p. 1436, P. Linn. Soc. N.S.W. (2) iii.

M. lindi, Port Lincoln, BLACKBURN, p. 1438, P. Linn. Soc. N.S.W. (2) iii, n. sp.

Allecula sertatipennis, Chaco, BERG, p. 125, An. Un. B. Aires, vi, n. sp.

Isomira oertzeni, Greece, REITTER, p. 257, Deutsche e. Z. 1889, n. sp.

Homotrysis tristis and *fuscipennis*, notes on; BLACKBURN, p. 1441, P. Linn. Soc. N.S.W. (2) iii.

Cistela australica, S. Australia, BLACKBURN, p. 1443, P. Linn. Soc. N.S.W. (2) iii; *C. (Ctenopus) apicipalpis*, Moupin, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 47 : n. spp.

Ctenopus varicolor, p. 676, *potanini*, p. 677, China, HEYDEN, Hor. Ent. Ross. xxiii, n. spp.

Mycetochares (Ernocharis) retowskyi, Crimea, REITTER, p. 374, Deutsche e. Z. 1889, n. sp.

Podonta biformis, Erzeroum, REITTER, p. 374, Deutsche e. Z. 1889, n. sp.

Omophlus nigrinus, Greece, REITTER, p. 257, Deutsche e. Z. 1889, n. sp.

Prostenus sipolisii, p. xlv, Minas Geraes, *laminicornis*, Cayenne, *violaceipennis*, p. xlv, *brevicornis*, *nodicornis*, p. xlv, Minas Geraes, *cyaneus* (Dej.), Brazil, *amplipalpis*, *angusticornis*, Minas Geraes, p. xlvii, FAIRMAIRE, C.R. ent. Belg. xxxiii, n. spp.

Xystropus griseostriatus, *griseovittatus*, Brazil, FAIRMAIRE, C.R. ent. Belg. xxxiii, p. xlviii, n. spp.

PYTHIDÆ.

[*Cf.* CHAMPION (324), OLLIFF (612).]

Spithobates, n. g., p. 104, for *S. scotosus*, Panama, pl. v, fig. 8, *maculatus*, Centr. America, fig. 9, p. 105, n. spp., CHAMPION, Biol. Centr. Am. Col. iv (2).

Sosthenes, n. g., p. 106, for *S. dyschirioides*, n. sp., Guatemala, p. 107, pl. v, fig. 10; CHAMPION, Biol. Centr. Am. Col. iv (2).

Lanthanus, n. g., p. 108, for *L. variegatus*, Centr. America, pl. v, fig. 12, p. 108, *nitidus*, Mexico, p. 109, fig. 13, n. spp.; CHAMPION, Biol. Centr. Am. Col. iv. (2).

Salpingus quichensis, Guatemala, CHAMPION, p. 107, pl. v, fig. 11, Biol. Centr. Am. Col. iv (2), n. sp.

Rhinosimus corticalis, Queensland, OLLIFF, p. 1512, P. Liun. Soc. N.S.W. (2) iii, n. sp.

MELANDRYIDÆ, PEDILIDÆ.

[Cf. CHAMPION (324), FAIRMAIRE (236), REITTER (679).]

Sallumia, n. g., near *Hypulus*, p. 46, for *S. davidis*, n. sp., Moupin, p. 47; FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix.

Eustrophus marginatus, Centr. America, pl. iv, fig. 2, *ovatus*, Guatemala, fig. 3, CHAMPION, Biol. Centr. Am. Col. iv (2), p. 76, n. spp.

Eustrophopsis, n. g., p. 77, for *Eustrophus ochraceus*, Motsch., figured, pl. vi, fig. 6, and the following n. spp.: *nigromaculatus*, Guatemala, pl. iv, fig. 4, *rotundatus*, Panama, fig. 5, p. 78, *discoideus*, Guatemala, fig. 7, p. 79, *bipunctatus*, Centr. America, fig. 8, p. 80; CHAMPION, Biol. Centr. Am. Col. iv (2).

Orchesia guatemalensis, Guatemala, CHAMPION, p. 80, pl. iv, fig. 9, Biol. Centr. Am. Col. iv (2), n. sp.

Microscapha minuta, Mexico and Guatemala, CHAMPION, p. 81, pl. iv, fig. 10, Biol. Centr. Am. Col. iv (2), n. sp.

Cuphosis, n. g., p. 81, for *O. attenuatus*, n. sp., Centr. America, p. 82, pl. iv, fig. 11; CHAMPION, Biol. Centr. Am. Col. iv (2).

Dircaea mexicana, Centr. America, p. 83, pl. iv, fig. 12, *pilicentris*, Panama, fig. 13, *longicornis*, Mexico, fig. 14, p. 84, CHAMPION, Biol. Centr. Am. Col. iv (2).

Xeures, n. g., p. 85, for *X. brevicollis*, n. sp., Mexico, p. 86, pl. iv, fig. 15; CHAMPION, Biol. Centr. Am. Col. iv (2).

Drauces, n. g., for *D. angustatus*, n. sp., Mexico, pl. iv, fig. 16; CHAMPION, p. 86, Biol. Centr. Am. Col. iv (2).

Symphora tropicalis, Guatemala, p. 87, pl. iv, fig. 17, *impressicollis*, Mexico, *apicalis*, Panama, fig. 18, *ruficeps*, p. 88, *maculata*, fig. 19, *convexa*, fig. 20, p. 89, *elongata*, p. 90, Guatemala, CHAMPION, Biol. Centr. Am. Col. iv (2), n. spp.

Melandrya incostata, Moupin, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 46, n. sp.

Osphya tuberculiventris, pl. iv, fig. 25, p. 95, *pallida*, p. 96, Guatemala, CHAMPION, Biol. Centr. Am. Col. iv (2), n. spp.

Polyppria cruz-rufa, Chev., figured, pl. v, fig. 1, Biol. Centr. Am. Col. iv (2).

Conomorphus, n. g., p. 98, for *C. pilosus*, pl. v, fig. 2, *brevicornis*, fig. 3, p. 99, *gracilicornis*, fig. 4, p. 100, Guatemala, *flavicornis*, Panama, p. 100, n. spp.; CHAMPION, Biol. Centr. Am. Col. iv (2).

Oleodæus, n. g., p. 100, for *C. rugiceps*, n. sp., Panama, p. 101, pl. v, fig. 5; CHAMPION, Biol. Centr. Am. Col. iv (2).

Physicus, n. g., p. 101, for *P. conicus*, n. sp., Centr. America, p. 12, pl. v, fig. 6, CHAMPION, Biol. Centr. Am. Col. iv (2).

Thisias, n. g., p. 102, for *T. marmoratus*, n. sp., Centr. America, p. 12, pl. v, fig. 7; CHAMPION, Biol. Centr. Am. Col. iv (2).

Canifa, characters discussed, p. 90; CHAMPION, Biol. Centr. Am. Col. iv (2).

C. speciosa, pl. iv, fig. 21, *oculata*, p. 91, *circumduta*, fig. 22, p. 2, Centr. America, CHAMPION, Biol. Centr. Am. Col. iv (2), n. spp.

Evalces, n. g. (*Scraphiides*) p. 92, for *E. griseus*, pl. iv, fig. 23, *dentipes*, Guatemala, p. 93, *sinuatipes*, Centr. America, fig. 24, *luteus*, *longulus*, Mexico, p. 94, n. spp.; CHAMPION, Biol. Centr. Am. Col. iv (2).

Scraphia, table of the European species; REITTER, Deutsche e. Z. 1863, pp. 267 & 268.

S. subdubia, Madrid, *subfoveolata*, Marocco, p. 267, *olutacea*, Marocco, *jakowleffi*, Astrachan, p. 268, REITTER, Deutsche e. Z. 1869, n. spp.

LAGRIIDÆ.

[Cf. BLACKBURN (75), CHAMPION (324), FAIRMAIRE (241), FLEUTIAUX & SALLÉ (277), REITTER (676).]

Lagria seminuda, Crete, REITTER, p. 259, Deutsche e. Z. 1889; *L. tincta*, Australia, BLACKBURN, p. 449, P. Linn. Soc. N.S.W. (2) iv: n. spp.

Sipolisia, n. g., for *S. serricornis*, n. sp., Minas Geraes; FAIRMAIRE, p. xlii, C.R. ent. Belg. xxxiii.

Statira glabrata, Mäkl., figured, pl. i, fig. 1, noticed, p. 7, *melanophala*, fig. 9, described, p. 13, *vilis*, fig. 20, described, p. 21, *nigrosparva*, figured, pl. ii, fig. 2, described, p. 29, *conspicillata*, figs. 6 & 7, noticed, p. 32, *pulchella*, fig. 8, *nigripennis*, figs. 17 & 18, varr. described, p. 40, CHAMPION, Biol. Centr. Am. Col. iv (2).

S. fulva, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 431; *S. denticulata*, Panama, p. 7, *unidentata*, pl. 1, fig. 2, *interrupta*, fig. 3, p. 8, *chiriquina*, fig. 4, p. 9, *scitula*, *tropicalis*, p. 10, *variabilis*, figs. 5 & 6, p. 11, *agrariformis*, fig. 7, *ingens*, fig. 8, p. 12, Centr. America, *collaris*, fig. 10, p. 13, *cæruleipennis*, fig. 11, *limbata*, fig. 12, p. 14, Mexico, *angustula*, Guatemala, *suavis*, Mexico, p. 16, *metallica*, fig. 13, *inconstans*, fig. 14, p. 16, Centr. America, *viridicollis*, fig. 15, Panama, p. 17, *foveicollis*, fig. 16, Centr. America, *crassicornis*, fig. 17, Mexico, p. 18, *isthmica*, fig. 18, Panama, *multiformis*, fig. 19, Centr. America, p. 19, *tolensis*, Panama, p. 20, *sobrina*, Mexico, *irazuensis*, Costa Rica, p. 22, *ignita*, fig. 21, Mexico, *cuprotincta*, Panama, fig. 22, p. 23, *verrepacia*, fig. 23, Guatemala, *curticollis*, fig. 24, Mexico, p. 24, *cæneipennis*, Guatemala, p. 25, *erata*, fig. 25, *mexicana*, pl. ii, fig. 1, p. 26, *ænotincta*, p. 27, Mexico, *punctipennis*, Guatemala, *testacea*, Mexico, p. 28, *penicillata*, fig. 3, *alternans*, p. 30, *tuberosa*, fig. 4, Mexico, *nodulosa*, p. 31, *tuberculifera*, fig. 5, p. 32, Guatemala, *nigromaculata*, figs. 9 & 10, p. 33, *triangulifer*, fig. 11, Centr. America, *evanescens*, fig. 12, p. 34, *retæcrucia*, fig. 13, p. 35, Mexico, *costariensis*, *picta*, fig. 14, *albolineata*, fig. 15, p. 36, Centr. America, *corrosa*, p. 37, *horrida*, fig. 16, Guatemala, *puncta-*

tissima, p. 39, *breripilis*, *villosa*, p. 39, *nigroænea*, fig. 19, p. 40, *setigera*, p. 41, Mexico, *cribrata*, fig. 20, *ciliata*, fig. 21, p. 42, Guatemala, *pilipes*, fig. 22, *marmorata*, fig. 23, p. 43, Mexico, *microps*, fig. 24, *albofasciata*, fig. 25, p. 44, Centr. America, *irregularis*, fig. 26, p. 45, Guatemala, *lævicollis*, pl. iii, fig. 1, p. 46, Mexico, *minima*, fig. 2, Centr. America, *bicolor*, fig. 3, Panama, p. 47, *rugicollis*, Mexico, *guatemalensis*, Guatemala, p. 48, *asperata*, fig. 4, Panama and Venezuela, *multipunctata*, fig. 5, Mexico, p. 49, *hirsuta*, fig. 6, Centr. America, p. 50, *pueblensis*, fig. 7, *sulciferus*, p. 51, *rugipes*, *leptotracheloides*, fig. 8, p. 52, Mexico, CHAMPION, Biol. Centr. Am. Col. iv (2), n. spp.

Hypostutira, n. g., p. xlix, for *H. variicolor*, n. sp., Minas Geraes, p. 1; FAIRMAIRE, C.R. ent. Belg. xxxiii.

Uroplatopsis, n. g., p. 53, for the following n. spp.: *imitator*, pl. iii, fig. 9, Nicaragua, *nodosa*, Ega, p. 54, *vermiculata*, fig. 10, Nicaragua, p. 55, *planicollis*, *reticulata*, fig. 11, p. 56, *mimica*, fig. 12, p. 57, *simulans*, fig. 13, *dilaticornis*, p. 58, *excavata*, fig. 14, *appendiculata*, fig. 15, p. 59, Panama, CHAMPION, Biol. Centr. Am. Col. iv. (2).

Epicyles, n. g., p. 60, for *E. oculatus*, pl. iii, figs. 16 a, b, c, *vicinus*, n. spp., Centr. America, p. 61, CHAMPION, Biol. Centr. Am. Col. iv (2).

Sphragidophorus, n. g., p. 61, for *Statira cyanipennis*, Makl., figured, pl. iii, fig. 17, and *S. violaceus*, pl. iii, fig. 18, p. 63, *singularis*, p. 64, n. spp., Panama; CHAMPION, Biol. Centr. Am. Col. iv (2).

Meniscophorus, n. g., p. 64, for *M. amazonicus*, S. Paulo, *costatus*, pl. iii, fig. 19, p. 65, Panama, n. spp.; CHAMPION, Biol. Centr. Am. Col. iv (2).

Colparthrum: *Statira decorata*, Makl., referred to; figured, pl. iii, fig. 20; described, p. 67; CHAMPION, Biol. Centr. Am. Col. iv (2).

C. foreiceps, p. 68, *sulcicollis*, pl. iii, fig. 21, p. 69, *ritticollis*, fig. 22, p. 70, *calcaratum*, fig. 23, p. 71, Nicaragua and Panama, CHAMPION, Biol. Centr. Am. Col. iv (2), n. spp.

Othryades, n. g., for *O. fragilicornis*, n. sp., Panama, pl. iii, fig. 24; CHAMPION, p. 72, Biol. Centr. Am. Col. iv (2).

Rhosuces, n. g., for *R. claripes*, n. sp., Panama, pl. iii, fig. 25; CHAMPION, p. 73, Biol. Centr. Am. Col. iv (2).

Stilpnonotus, Gray, = (*Calophthalmus*, Thoms.); CHAMPION, p. 73, Biol. Centr. Am. Col. iv (2).

S. thomsoni, Nicaragua, CHAMPION, p. 74, pl. iv, fig. 1, Biol. Centr. Am. Col. iv (2), n. sp.

ANTHICIDÆ, MORDELLIDÆ, RHIPIDOPHORIDÆ, STYLOPIDÆ.

[Cf. BERG (51), FLEUTIAUX & SALLÉ (277), FOWLER (283), HEYDEN (376), REITTER (672, 676).

Formicomus pedestris, n. var. *atratus*; REITTER, p. 33, Deutsche e. Z. 1889.

F. unctus, Araxes Valley, REITTER, p. 33, Deutsche e. Z. 1889, n. sp.

Notoxus monoceros, L., teratology; FOWLER, Ent. M. M. xxv, p. 435.

Anthicus araxicola, Araxes Valley, REITTER, p. 34, Deutsche e. Z. 1889; *A. pinicola*, *corallicollis*, p. 258, *chiosicola*, p. 259, Greece; REITTER, Deutsche e. Z. 1889: n. spp.

Mordella sororcula, Argentine Rep., BERG, p. 124, *An. Un. B. Am.* vi, n. sp.

Anaspis garneysi, England, FOWLER, *Ent. M. M.* xxv, p. 333; *L. (Larisia) flavipennis*, Turkestan, HEYDEN, p. 329, *Deutsche e. Z.* 1889 : n. spp.

Emenadia vitraci, Guadeloupe, FLEUTIAUX & SALLÉ, *Ann. Soc. Ent. Fr.* (6) ix, p. 432, n. sp.

Stylops, changes produced in *Andrena* by ; SAUNDERS (756).

CANTHARIDÆ.

[*Of.* BEAUREGARD (41), BERG (51), DUGÈS (206), ESCHERICH (230, 231, 232), FAIRMAIRE (236), FLEUTIAUX & SALLÉ (277), HEYDEN (376), REITTER (672, 685), WATERHOUSE (1).]

Meloë, systematic position noticed ; BEAUREGARD, *Bull. Soc. Ent. Fr.* (6) ix, p. cviii : list of species added since the Munich Catalogue ; ESCHERICH, *Deutsche e. Z.* 1889, pp. 333-335. *Meloë* and *Lytta*, structure of tarsal clothing ; PERO (627). *M. proscarabæus*, embryology of ; NUSBAUM (607). *M. autumnalis*, metamorphosis ; BEAUREGARD (41) : habit of larva ; BEAUREGARD, *Bull. Soc. Ent. Fr.* (6) ix, p. xxxi. *M. autumnalis*, Ol., and *hiemalis*, Gredl., discussed and treated as one species ; ESCHERICH, pp. 109-111, *Wien. ent. Z.* viii. *M. proscarabæus*, n. var., *simplicicornis*, p. 105, *autumnalis*, n. var. *heydeni* ; ESCHERICH, *Wien. ent. Z.* viii.

Meloë splendens, Germany, ESCHERICH, p. 105, *Wien. ent. Z.* viii ; *M. reitteri*, S. Russia, ESCHERICH, p. 112, *Wien. ent. Z.* viii ; *M. deflexus*, Syria, p. 106, *escherichi*, Armenia, p. 107, REITTER, *Wien. ent. Z.* viii : n. spp.

Leonia, n. g., for *L. rileyi*, n. sp., Mexico ; DUGÈS, *Ins. Life*, i, pp. 211-213.

Aphyctus picticollis, Turkestan, HEYDEN, p. 328, *Deutsche e. Z.* 1889, n. sp.

Cerocoma muhlfeldi n. var. *marginiventris* ; REITTER, p. 34, *Deutsche e. Z.* 1889.

Mylabris chevrolati, n. n. for *12-punctata*, Chev., *nec* Ol. ; *ocollata*, Cl., to be replaced by *ocellaris*, Ol. ; *persica*, n. n. for *signata*, Mars., *nec* Fisch. ; BEAUREGARD, *Bull. Soc. Ent. Fr.* (6) ix, p. ccxiii. *M. oculata*, *lunata*, ravages of ; ORMEROD, *Injur. ina. S. Afr.* p. 21.

M. goutellii, Thibet, FAIRMAIRE, *Ann. Soc. Ent. Fr.* (6) ix, p. 48, n. sp.

Tetraonyx cruciatus, Cast., synonymical note ; BEAUREGARD, *Bull. Soc. Ent. Fr.* (6) ix, p. ccxii.

Epicauta femoralis, Er., = (*erythroscelis*, Berg) ; *somnolenta*, n. n. for *alborivittata*, Haag, *nec* Gestro ; *vittula*, n. n. for *subvittata*, Haag, *nec* Er. ; BEAUREGARD, *Bull. Soc. Ent. Fr.* (6) ix, p. ccxiii. *E. atkinsoni*, n. n. for the Indian *E. niveolineata*, Haag ; *E. dugesi*, n. n. for *vittata*, Dug., *nec* Fabr. ; *id. l. c.* *E. maculata*, Say, *callosa*, Lec., structure of epipharynx ; PACKARD, *Psyche*, v, pp. 224 & 225.

Cantharis inflaticeps, n. n. for *fissiceps*, Haag, *nec* Lec. ; *ulkei*, n. n. for *lugubris*, Ulke, *nec* Kl. ; BEAUREGARD, *Bull. Soc. Ent. Fr.* (6) ix, p. ccxii.

C. interrupta, Thibet, FAIRMAIRE, *Ann. Soc. Ent. Fr.* (6) ix, p. 48 ; *C.*

12 *conspicua*, fig. 15, *glabricollis*, fig. 7, *luta*, fig. 6, Afghanistan, WATERHOUSE, p. 129, pl. xiv, Tr. L. S. (2) v : n. spp.

13 *Lytta* ? *delauneyi*, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 433; *L. exclamatoria*, p. 120, *pullata*, p. 121, *purpureiceps*, p. 123, S. America, BERG, An. Un. B. Aires, vi : n. spp.

14 *Calenae*, n. g., p. 34, for *C. pulcher*, n. sp., Ordubad, p. 35; REITTER, Deutsche e. Z. 1889.

Halosimus armeniacus, Araxes Valley, REITTER, Deutsche e. Z. 1889, n. sp.

Nemognatha walkeri, n. n. for *N. bicolor*, Walk.; BEAUREGARD, Bull. Soc. Ent. Fr. (6) ix, p. ccxii. *M. lurida*, Lec., structure of epipharynx; PACKARD, Psyche, v, p. 225.

Zonitis abdominalis, Cast., = (*puncticollis*, Chev.); *Z. 4-punctata*, Fab., var., = (*fulvipennis*, Fab.); BEAUREGARD, Bull. Soc. Ent. Fr. (6) ix, p. ccxii.

Apatus hamapterus, Moupin, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 49; *A. plagiatas*, Afghanistan, WATERHOUSE, Tr. L. S. (2) v, p. 130, pl. xiv, fig. 14 : n. spp.

EDEMERIDÆ.

[Cf. CHAMPION (324), FAIRMAIRE (236), FLEUTIAUX & SALLÉ (277), FOKKER (282), REITTER (672, 678).]

Ctenopus vitticollis, Araxes Valley, *rufoscutellatus*, Askhabad, REITTER, p. 38, Deutsche e. Z. 1889, n. spp.

Calopus mixtus, p. 111, pl. v, fig. 19, *obsoletus*, *rugicollis*, Guatemala, *depressus*, pl. v, fig. 20, Mexico, p. 112, CHAMPION, Biol. Centr. Am. Col. iv (2), n. spp.

Microtonus figuratus, Mexico, pl. v, fig. 14, *gracilis*, fig. 15, p. 114, *pilosus*, *nitidulus*, fig. 16, Guatemala, *elongatus*, fig. 17, Mexico, p. 115, *fusiformis*, fig. 18, p. 116, Guatemala, CHAMPION, Biol. Centr. Am. Col. iv (2), n. spp.

Ditylus brachinoides, pl. v, fig. 21, Mexico, *longicollis*, fig. 22, p. 118, *cephalotes*, fig. 23, *tepanensis*, p. 119, Guatemala, *mexicanus*, fig. 24, p. 120, Mexico, CHAMPION, Biol. Centr. Am. Col. iv (2).

Xanthochroa metallipennis, p. 49, *fulvicrus*, p. 50, Moupin, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, n. spp.

Anoncodes strangulata, Moupin, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 50, n. sp.

Nacerdes melanura, its injuries to maritime timber, metamorphoses; FOKKER, Tijdschr. Ent. xxxii, pp. 401-418, pl. xi.

Ascleru thoracica, *suturalis*, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 434, n. spp.

Chrysanthia, table of the European species; REITTER, Deutsche e. Z. 1889, p. 266.

C. flavipes, Syria, REITTER, Deutsche e. Z. 1889, p. 266, n. sp.

Chitona ganglbaueri, Ordubad, REITTER, p. 38, Deutsche e. Z. 1889, n. sp.

Mycterus depressus, Mexico, CHAMPION, p. 96, pl. iv, fig. 26, Biol. Centr. Am. Col. iv (2), n. sp.

CURCULIONIDÆ.

[*Cf.* BLACKBURN (74), BRISOUT (103), BUDDEBERG (112), CARPENTIER (132), DESBROCHERS (179, 180, 182), DIETZ (185), FAIRMAIRE (236, 241, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255), FOKKER (26), FLEUTIAUX & SALLÉ (277), FRIVALDSZKY (291), KIRSCH (455), KOLLI (465), OLLIFF (610), PASCOE (623, 624), REITTER (672, 683, 684), BELOFS (737), SHARP (324, 807), STARCK (842), STIERLIN (850, 851), TONNIER (863), WATERHOUSE (907), WEBSTER (903).]

Brachyderides, Otiorhynchides, Leptopsides.

Synaptorhinus, n. g., *Blosyrini*, for *S. simplex*, n. sp., Asia Minor. FAUST, p. 227, Wien. ent. Z. viii.

Symmathetes pascoei, Ecuador, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 12, pl. ii, fig. 29, n. sp.

Liophleus, the European species discussed and tabulated; STIERLIN. MT. schw. ent. Ges. viii, pp. 77-87.

Eurymetopus alticola, Ecuador, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 13, pl. ii, fig. 30, n. sp.

Strophomorphus oertzeni, p. 73, *creticus*, p. 74, Mediterranean region. FAUST, Deutsche e. Z. 1889, n. spp.

Caulostrophus aequatorialis, Ecuador, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 13, pl. ii, fig. 31, n. sp.

Foucartia bella, Sporades, FAUST, Deutsche e. Z. 1889, p. 70, n. sp.

Naupactus steinheili, Colombia, p. 13, pl. ii, fig. 32, *episternalis*, Ecuador, p. 14, fig. 33, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, n. spp.

Mimographus rittatus, p. 14, pl. ii, fig. 34, *rotundicollis*, *versicolor*, fig. 35, *brevisetosus*, p. 15, Colombia and Ecuador, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, n. spp.

Canephorus, n. g., *Naupactidarum*, p. 16, for *C. rufipes*, *jelskyi*, pl. ii, fig. 36, p. 16, *vulcanorum*, fig. 36, p. 17, n. spp., Bolivia and Ecuador. KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4.

Sitona circumductus, *ophthalmicus*, Desbr., characters of; FAUST, p. 84, Deutsche e. Z. 1889.

S. correcta, Alka-Kul, FAUST, p. 130, Deutsche e. Z. 1889, n. sp.

Polydrosus sericeus, injurious to young beeches; KIRSCH, Ent. Nachr. xv, p. 58. *P. armipes*, Bal., varietal note; FAUST, p. 69, Deutsche e. Z. 1889.

Conocetus, systematic position of, p. 71: *C. gracilicornis*, Kirs., synonymy of, p. 72; FAUST, Deutsche e. Z. 1889. *C. gracilis*, Strl., and *marcidus*, Kr., synonymy of; FAUST, p. 93, Deutsche e. Z. 1889.

C. laudii, Cyprus, FAUST, p. 73, Deutsche e. Z. 1889, n. sp.

Astyeus chinensis, Moupin, FAIRMAIRE, p. 51, Ann. Soc. Ent. Fr. (6) ix, n. sp.

Stigmatrachelus fasciculatus, Madagascar, FAUST, S. E. Z. 1, p. 81, n. sp.

Dermatodes truncatirostris, China, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 51, n. sp.

Cyphus mucoreus, Peru, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 17, pl. ii, fig. 38, n. sp.

Melictus? *acutus*, New Caledonia, FAUST, S. E. Z. 1, p. 62, n. sp.

Platymus laticungis, Ecuador, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 17, n. sp.

Compus quadrilineatus, *opulentus*, pl. ii, fig. 39, p. 18, *fossicollis*, *adamantinus*, fig. 40, *bituberculatus*, fig. 41, p. 19, *alternans*, *ater*, fig. 42, p. 20, *popayanus*, *variegatus*, fig. 43, p. 21, *bicarinatus*, *labyrinthicus*, p. 22, *quadririttatus*, fig. 44, *espeletice*, fig. 45, p. 23, *linuligi*, fig. 46, p. 24, N.W. South America, KIRSCH, Abh. zool. Mus. Dresden, 1883-89, No. 4 : n. spp.

Diaprepes vitraci, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 437, n. sp.

Rhinocapha thomsoni, Louisiade Arch., WATERHOUSE, p. 364, Ann. N. H. (6) iv, n. sp.

Brachyomus sulcicollis, Ecuador, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 24, pl. ii, fig. 47, n. sp.

Apirocalus thomsoni, Louisiade Arch., WATERHOUSE, p. 364, Ann. N. H. (6) iv, n. sp.

Otiorynchus, structure of clothing of tarsi ; PERO (627). *O. sulcatus*, larva and metamorphosis ; LETZNER, J. Ber. schles. Ges. 1887, pp. 340-344. *Brachyrrhinus lugdunensis*, habits ; SÉNAC, Bull. Soc. Ent. Fr. (6) ix, p. cxv. *O. bicostatus* and allies, note on, with reference to the extent of the subg. *Cryphiphorus*, and tabulation of the species ; STIERLIN, Deutsche e. Z. 1889, pp. 225-231.

O. montigena, Hungary, FRIVALDSZKY, Term. fuzetek, xi, p. 161 ; *O. prorus*, Ordubad, REITTER, p. 39, Deutsche e. Z. 1889 ; *O. adeluideæ*, Circassia, p. 69, *opertus*, *fischtenensis*, p. 101, *marthæ*, p. 102, REITTER, Wien. ent. Z. viii ; *O. (Aramnichus) morosus*, Alka-kul, FAUST, p. 129, Deutsche e. Z. 1889 ; *O. (Cryphiphorus) koronæ*, p. 229, *atticus*, p. 230, Greece, STIERLIN, Deutsche e. Z. 1889 : n. spp.

Psalidium spinimanum, n. var. *kiesencetteri*, p. 77, *lecratii*, n. var. *rugicollis*, p. 78 ; FAUST, Deutsche e. Z. 1889.

P. parnassicum, Greece, FAUST, p. 94, Deutsche e. Z. 1889 ; *P. reichæ*, p. 77, *cumulatum*, p. 79, *auxiliare*, p. 80, *creticum*, p. 82, Mediterranean region, FAUST, Deutsche e. Z. 1889 : n. spp.

Axyæus, considered as subg. of *Psalidium* ; FAUST, p. 83, Deutsche e. Z. 1889.

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Platytarsus oertzeni, Eubœa, FAUST, p. 70, Deutsche e. Z. 1889, n. sp.

Aomus, its characters and position discussed ; FAUST, S. E. Z. 1, p. 232.

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Listronotus latiusculus, Boh., metamorphoses ; WIED, Bull. Ohio Exp. Station i, p. 10, pl. ii, fig. 1.

Macrops, Kirby, = (*Hyperodes*, Jek.) ; DIETZ, Tr. Am. Ent. Soc. xvi, p. 28.

M. indistinctus, *cryptops*, p. 32, *hyperodes*, p. 33, *nevadensis*, p. 34, *grypidioides*, p. 35, *wickhami*, *interpunctatulus*, p. 36, *ulkei*, *dorsalis*, p. 37, *tenebrosus*, *alternatus*, p. 38, *montanus*, *interstitialis*, p. 39, *hornii*, p. 40, *setiger*, p. 41, *subcristatus*, p. 42, *longulus*, *rotundicollis*, p. 44, *obscurulus*,

imbellis, p. 45, *hirtellus*, *echinatus*, p. 46, *obtectus*, p. 47, *myxusellus*, p. 48, *mirabilis*, p. 49, *californicus*, p. 50, *anthracinus*, p. 51, N. America, DINT. Tr. Am. Ent. Soc. xvi, n. spp.

Phyllobius fulvagoides, var. described; FAUST, p. 69, Deutsche e. Z. 1889.

P. ballionis, Caucasus, STARCK, p. 54, Wien. ent. Z. viii; *P. claviger*, Ussuri, FAUST, S. E. Z. 1, p. 234; *P. japonicus*, Japan, FAUST, S. E. Z. 1, p. 221; *P. (Parascytopus) creticus*, Crete, FAUST, p. 92, Deutsche e. Z. 1889: n. spp.

Phyllolytus, n. g., near *Mylocerus*, for *P. longicornis*, n. sp., China; FAIRMAIRE, p. 52, Ann. Soc. Ent. Fr. (6) ix.

Mylocerus hilleri, Japan, FAUST, S. E. Z. 1, p. 222; *M. fasciatus*, p. 1442, *darwini*, p. 1443, S. Australia, BLACKBURN, P. Linn. Soc. N.S.W. (2) iii: n. spp.

Tropiphorus, notes on the European species; REITTER, p. 126, Wien. ent. Z. viii.

Homaleptops, n. g., for *H. benignus*, n. sp., Madagascar, FAUST, S. E. Z. 1, p. 83.

Leptops etheridgei, Lord Howe I., OLLIFF, p. 88, pl. vi, fig. 5, Lord Howe Island; *L. insignis*, p. 1443, *baileyi*, p. 1444 (FRASER I.), *frontalis*, p. 1445, Australia, BLACKBURN, P. Linn. Soc. N.S.W. (2) iii: n. spp.

Zymus inconspicuus, S. Australia, BLACKBURN, p. 1446, P. Linn. Soc. N.S.W. (2) iii, n. sp.

Lipothyrea (?) *variabilis*, S. Australia, BLACKBURN, p. 1448, P. Linn. Soc. N.S.W. (2) iii, n. sp.

Byrsopsides to Tanyrhynchides.

Rhytirrhinus transatlanticus, Ecuador, KIRSCH, Abh. zool. Mus. Dresden. 1888-89, No. 4, p. 24, pl. ii, fig. 18, n. sp.

Macrostyphlus, n. g., *Rhypparosomidarum*, for *M. gualcaler*, n. sp., Colombia; KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 25, pl. ii, fig. 19.

Ocromis, n. g., *Cylindrorrhinidarum*, for *O. puncticollis*, n. sp., Colombia, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 25, pl. iii, fig. 50.

Lithinus hildebrandti, p. 84, *pipitzi*, p. 86, Madagascar, FAUST, S. E. Z. 1, n. spp.

Liosomus, n. g., for *L. fairmairei*, n. sp., Madagascar; FAUST, p. 87, S. E. Z. 1.

Molytes, structure of tarsal clothing; PERO (627). *M. coronatus* injurious to carrots; FALLOU (245).

Liparus (Trysilus) græcus and *punctipennis*, variation and synonymy; FAUST, pp. 85-88, Deutsche e. Z. 1889.

Liosoma fausti, Ecuador, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 26, pl. iii, fig. 57, n. sp.

Melous squamosus, Circassia, p. 103, REITTER, Wien. ent. Z. viii, n. sp.

Ischiomastus, n. g., *Plinthidarum*, for *I. plinthoides*, n. sp., Ecuador, pl. iii, fig. 53; KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4.

Micropeltastes, n. g., *Plinthidarum*, p. 27, for *M. rufopictus*, n. sp.

Ecuador, p. 28, pl. iii, fig. 54, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4.

Cyrtaspis planicollis, Colombia, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 26, pl. iii, fig. 12, n. sp.

Cycloteres aranea, Madagascar, FAUST, S. E. Z. I, p. 89, n. sp.

Tunyrhynchides, note on the characters of ; FAUST, Deutsche e. Z. 1889, p. 140.

Tunyrhynchus viridis, Darjiling, *T. (?) pusillus*, Madagascar, FAUST, p. 144, Deutsche e. Z. 1889, n. spp.

Goniorhinus, n. g., *Myorhiniides*, p. 142, for *G. erinaceus*, n. sp., Transvaal, p. 143 ; FAUST, Deutsche e. Z. 1889.

Scythropides to Aterpides.

Scythropus, note on synonymy of some species ; DESBROCHERS, Bull. Soc. Ent. Fr. (6) ix, p. cccxv.

S. variabilis, p. cccxv, *confusus*, p. cccxvi, Algeria ; DESBROCHERS, Bull. Soc. Ent. Fr. (6) ix, n. spp.

Oxyops interruptus, p. 1449, *parallelus*, p. 1450, *armatus*, *lateritius*, p. 1451, *modicus*, p. 1452, *maculata* (Fraser I.), p. 1453, Australia, BLACKBURN, P. Linn. Soc. N.S.W. (2) iii, n. spp.

Lepidophorus pilifrons, Ecuador, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 28, n. sp.

Hypera noscidia, Greece, FAUST, p. 84, Deutsche e. Z. 1889, n. sp.

Phytonomus variabilis, metamorphoses and parasites ; CARPENTIER, Mém. Soc. L. N. Fr. vii, pp. 65 & 69.

Medicasta obscura, S. Australia, BLACKBURN, p. 1454, P. Linn. Soc. N.S.W. (2) iii, n. sp.

Cleonides to Hylobiides.

Cleonus picipes, *roridus*, *verrucosus*, *aquila*, notes on ; FAUST, S. E. Z. I, pp. 229 & 230.

Larinus lederi, p. 203, *remissus*, p. 204, *reitteri*, p. 205, Araxes Valley, FAUST, Wien. ent. Z. viii, n. spp.

Lixus concavus, Say, habits ; WEED, Bull. Ohio Station, ii, p. 153, pl. i, figs. 6 & 7. *L. macer*, habits and life history ; WEBSTER, Ent. Am. v, pp. 11-16.

L. dohrni, p. 90, *anthracinus*, p. 92, *madagassus*, p. 93, *sejugatus*, p. 94, *angulicollis*, p. 95, *subcuneatus*, p. 96, Madagascar, FAUST, S. E. Z. I, n. spp.

Sternechus vicinus, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 442, n. sp.

Hylobius ? albosetosus, Moupin, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 52, n. sp.

Sophronobius, n. g., near *Eudocimus*, for *S. falcatus*, n. sp., New Caledonia ; FAUST, p. 63, S. E. Z. I.

Heilipus anchoralis, pl. iii, fig. 55, *scutellatus*, *inca*, fig. 56, Ecuador and Peru, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 29 ; *H. pardalis*, Sarayacu, pl. xvi, fig. 5, *lutosus*, Columbia, p. 578, *fryi*, Peru, pl. xvi, fig. 8, var., *excultus*, p. 579, *fimbriatus*, pl. xvii, fig. 1,

p. 580, Brazil, *validus*, pl. xvi, fig. 6, Minas Geraes, *decipiens*, Columbia p. 581, *ocularis*, S. America, pl. xvii, fig. 2, *obtusus*, St. Catherine, p. 582, *ludiosus*, Parana, pl. xvii, fig. 8, *arcturus*, Bahia, fig. 7, p. 583, *congens*, Para, p. 584, *angusticollis*, Cayenne, pl. xvi, fig. 3, *tetraspilotus*, Parana, fig. 2, p. 585, *frontalis*, Chontales, p. 586, pl. xvii, fig. 5, *latipennis*, pl. xv, fig. 1, p. 586, *polyspilus*, p. 587, *lunata*, *basiliscus*, pl. xvi, fig. 4, p. 588, *renesi*, Brazil, *phrynodes*, Chontales, p. 589, *arrogans*, Brazil, pl. xvii, fig. 6, p. 590, *designatus*, pl. xvi, fig. 7, *cornix*, pl. xvii, fig. 4, p. 591, Colombia, PASCOE, Tr. E. Soc. 1889 : n. spp.

Pissodes affinis, male characters ; SCHWARZ, P. E. Soc. Washington, i. p. 176.

Orthorrhinus vagus, Lord Howe I., OLLIFF, p. 89, Lord Howe Island, n. sp.

Eirrhinides.

Hypoglyptus heydeni, Asia Minor, FAUST, S. E. Z. 1, p. 226, n. sp.

Hydronomini, definition of ; FAUST, S. E. Z. 1, p. 65.

Sclerolophus, n. g., for *S. collinus*, n. sp., New Caledonia ; FAUST, S. E. Z. 1, p. 65.

Hydronomides : European and Mediterranean genera of the group discussed and tabulated ; TOURNIER, L'Ent. Gen. i, pp. 145-149.

Faustia, n. g., p. 150, for *F. mesopotamica*, Kars, *caucasica*, Achalzik, p. 152, *millingi*, Jeddah, *ephimeropoides*, Derbent, p. 153, n. spp. : TOURNIER, L'Ent. Gen. i.

Acanthopterus, n. g., near *Oropterus*, p. 67, for *Trachodes penicillatus*, Montr. ; FAUST, p. 67, S. E. Z. 1.

Belides to *Apionides*.

Belus acrobeles, Lord Howe I., OLLIFF, p. 89, pl. vi, fig. 2, Lord Howe Island ; *B. insipidus*, S. Australia, BLACKBURN, p. 1455, P. Linn. Soc. N.S.W. (2) iii : n. spp.

Isacantha inculta, Lord Howe I., OLLIFF, p. 90, Lord Howe Island, n. sp.

Tanaos and *Cylades*, to be placed in *Eurhynchides* : FAUST, S. E. Z. 1, p. 79.

Apion, tabulation of genera allied to ; FAUST, S. E. Z. 1, p. 79. *A. flavofemoratum* and *croceifemoratum*, characters of ; WEISE, p. 184, Deutsche c. Z. 1889. *A. eppelsheimi*, characters amended, p. 228, *dichroma*, var. described, p. 229 ; FAUST, S. E. Z. 1. *A. humile* reared from galls on *Rumex acetosella* ; RÜBSAAMEN, p. 65, B. E. Z. xxxiii.

A. corvinaum, *lugubre*, p. 224, *praevarium*, p. 225, Japan, FAUST, S. E. Z. 1 ; *A. fausti*, Caucasus, *bipartirostre*, *distans*, Russia mer., p. xxxiii, *fossicollis*, *canescens*, Syria, *provinciale*, S. France, *andalusiacum*, *longitubus*, Spain, p. xxxiv, *angustissimum*, Caucasus, *longithorax*, Algeria, p. xxv, DESBROCHERS, Bull. Soc. Ent. Fr. (6) ix ; *A. ciliare*, *semicærulans*, Algeria, DESBROCHERS, Bull. Soc. Ent. Fr. (6) ix, p. ccxvi : n. spp.

Pterapion, n. g., p. 75, for *P. monstrosus*, n. sp., New Caledonia, p. 76 : FAUST, S. E. Z. 1.

Megatrachelus, n. g., for *M. chloris*, n. sp., New Caledonia ; FAUST, p. 77, S. E. Z. 1.

Rhadinocyba, n. g., p. 78, for *R. nitidipennis*, n. sp., New Caledonia, p. 79 ; FAUST, S. E. Z. 1.

Attelabides.

Structure of prosternum in *Attelabidæ* ; SHARP, p. 41, Tr. E. Soc. 1889.

Apoderus, structure of tarsal clothing ; PERO (627). *A. nigricollis*, Roel., ♀ = (*montanus*, Roel.), p. 44, *riticeps*, Jek., = (*van-voleemi*, Roel., and *tuberculatus*, Har.), p. 48, *pardalis*, Voll., = (*tigrinus*, Roel.), p. 49, *erythropterus*, Gmel., variation and synonymy, pp. 49 & 50 ; SHARP, Tr. E. Soc. 1889.

A. limbatus, Madagascar, FAUST, S. E. Z. 1, p. 81 ; *A. præcellens*, p. 46, *subornatus*, p. 47, *geminus*, p. 50, *uniformis*, p. 51, Japan, SHARP, Tr. E. Soc. 1889 : n. spp.

Phialodes, Roel., merged in *Attelabus* ; *P. rufipennis* = ? *A. rubripennis*, Chev. ; SHARP, pp. 52 & 53, Tr. E. Soc. 1889.

Attelabus, Ol., = (*Cyphus*, Bed.) ; SHARP, Tr. E. Soc. 1889, pp. 52 & 53. *A. viridans*, Gyll., pl. i, fig. 1, *splendens*, fig. 2, *klugi*, fig. 3, *axillaris*, fig. 4, *lesicollis*, fig. 5, sexes described, p. 6, *ater* var. = (*sallæi*, Jek.), p. 11, fig. 8, *binotatus*, fig. 11, figured and noticed ; SHARP, Biol. Centr. Am. Col. iv (3).

A. lewisii, Japan, SHARP, p. 53, Tr. E. Soc. 1889 ; *A. smithi*, p. 2, *nigriclava*, p. 3, *diffinis*, p. 4, *vinosus*, *heterocerus*, p. 5, Mexico, *callosus*, pl. i, fig. 6, p. 7, *conicollis*, fig. 7, *sedatus*, Centr. America, *angulipennis*, Guatemala, p. 8, *brevicollis*, *melanopygus*, Mexico, *longiclava*, Panama, *ligulatus*, Centr. America, p. 10, *quadratus*, Nicaragua, p. 11, *bullatus*, *auratus*, fig. 9, Guatemala, p. 12, *breviceps*, fig. 10, p. 13, *fenestratus*, fig. 12, *championi*, Panama, *cruralis*, fig. 13, p. 14, *mundanus*, *inaequalis*, fig. 14, p. 15, Centr. America, SHARP, Biol. Centr. Am. Col. iv (3) : n. spp.

Euops, characters of ; SHARP, Tr. E. Soc. 1889, p. 54.

E. lespedezeæ, p. 55, *phædonius*, *pustulosus*, p. 56, Japan, *wallacei*, New Guinea, p. 55, SHARP, Tr. E. Soc. 1889, n. spp.

Rhinomacerides.

Rhynchitidæ, note on structure of prosternum in ; SHARP, Tr. E. Soc. 1889, p. 57.

Byctiscus motschoulskyi and congener, note on ; *B. venustus*, Pasc., = (*haroldi*, Roel.), p. 59 ; *lacunipennis*, Jek., = (*cicatricosus*, Motsch., Faust), p. 61 ; SHARP, Tr. E. Soc. 1889.

B. reversus, *fausti*, Japan, *parvulus*, E. Siberia, p. 60, *morosus*, Laos, p. 61, SHARP, Tr. E. Soc. 1889, n. spp.

Rhynchites aquatus, L., metamorphoses ; BUDDEBERG, JB. nass. Ver. xli, pp. 26-28. *R. betuleti*, ravages in Hungary, p. 337, pl. 8, fig. 2 ; SHIPLEY, P. Cambr. Phil. Soc. vi. *R. parvulus* n. var. *fallax* ; STARCK, p. 55, Wien. ent. Z. viii. *R. mexicanus*, figured, pl. i, fig. 15, noticed, p. 16 ; SHARP, Biol. Centr. Am. Col. iv (3).

R. placidus, p. 63, *funebri*, p. 64, *apertus*, p. 66, *apionoides*, *truncatus*, p. 67, Japan ; SHARP, Tr. E. Soc. 1889 ; *R. zunilensis*, pl. i, fig. 16,

distans, Guatemala, *abnormalis*, fig. 17, p. 17, *lenticulus*, *subauratus*, p. 18, *mollis*, Mexico, *scutellaris*, Guatemala, *basalis*, Panama, p. 19, *auleticoides*, Guatemala, *regularis*, Mexico, *confertus*, Panama, p. 20, *oculatus*, *guatemalensis*, Guatemala, *debilis*, Mexico, p. 21, *pusillus*, pl. i, fig. 18, *chunquensis*, Panama, *thesaurus*, p. 22, *flaviventris*, *championi*, p. 23, *Mexico centralis*, fig. 19, Guatemala, *mixtus*, Mexico, *inermis*, Centr. America, p. 24, *addendus*, fig. 20, Mexico, p. 25, SHARP, Biol. Centr. Am. Col. iv (3); *R. (Deporaus) podager*, Syria, DESBROCHERS, Bull. Soc. Ent. Fr. (6) ix, p. xxxv : n. spp.

Deporaus, note on the characters of ; SHARP, p. 70, Tr. E. Soc. 1889.

D. fuscipennis, Japan, SHARP, p. 71, Tr. E. Soc. 1889, n. sp.

Aderorhinus, n. g., for *Rhynchites crioceroides*, Roel. ; SHARP, p. 68, Tr. E. Soc. 1889.

Merhynchites, n. g., for *Rhynchites hungaricus* and *bicolor*, auct. ; SHARP, p. 57, Tr. E. Soc. 1889.

Rhynchitobius, n. g., for *R. longicollis*, Panama, n. sp., pl. i, fig. 21 : SHARP, p. 26, Biol. Centr. Am. Col. iv (3).

Eugnaptus, note on characters ; SHARP, p. 69, Tr. E. Soc. 1889. *E. (sub Rhynchites) amurensis*, Faust, = (*fragilis*, Sharp) ; FAUST, S. E. Z. I. p. 223.

E. fragilis, p. 69, *flavipes*, p. 70, Japan, SHARP, Tr. E. Soc. 1889 ; *E. validus*, pl. i, fig. 25, Guatemala, *divisus*, Centr. America, pl. ii, fig. 1, *diabroticus*, fig. 2, Guatemala, p. 30, *maculatus*, fig. 3, Mexico, *basalis*, p. 31, *godmani*, fig. 4, Panama, *latirostris*, *semimaculatus*, Guatemala, p. 32, *seriatus*, Mexico, *dispar*, Centr. America, p. 33, *cinctus*, figs. 5 & 6, *tibialis*, Mexico, *longipes*, p. 34, *hirtellus*, Guatemala, *nigricornis*, p. 35, *rufifrons*, fig. 7, *niger*, *longulus*, p. 36, Mexico, *semivittatus*, Panama, *obscurus*, fig. 8, *varius*, fig. 9, Guatemala, p. 37, *nigripennis*, fig. 10, *suturalis*, Panama, *plebeius*, Mexico, p. 38, *brevicollis*, Panama, fig. 11, *cornutus*, pl. iii, fig. 1, Mexico, *salvini*, pl. ii, fig. 12, Guatemala, p. 39, *antennalis*, Panama, *latifrons*, fig. 13, Guatemala, *truncatus*, Centr. America, p. 40, SHARP, Biol. Centr. Am. Col. iv (3) : n. spp.

Hemilypus, n. g., p. 26, for *H. latipes*, pl. i, fig. 22, *sallæi*, Mexico, *hondurensis*, p. 27, *obliteratus*, Panama, fig. 23, p. 28, n. spp. : SHARP, Biol. Centr. Am. Col. iv (3).

Essodius, n. g., p. 28, for *E. unicolor*, n. sp., Mexico, p. 29, pl. i, fig. 24 : SHARP, Biol. Centr. Am. Col. iv (3).

Auletes calvus, p. 72, *submaculatus*, p. 73, Japan, SHARP, Tr. E. Soc. 1889, n. sp.

Auletobius, note on the characters of : SHARP, p. 74, Tr. E. Soc. 1889.

Balaninides to *Cionides*.

Pseudobalaninus, n. g., p. 97, for *P. bohemanii*, p. 98, *semifasciatus*, p. 99, *pulcher*, p. 100, n. spp., Madagascar : FAUST, S. E. Z. I.

Anthonomus rubi, Hbst., life history ; BUDDENBERG, JB. nass. Ver. xli. pp. 22-25.

A. costipennis, Thibet, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 54, n. sp.

Tychius meliloti, squamosity changes colour in connection with food

plant ; TOURNIER, C.R. ent. Belg. xxxiii, p. xxiv. *T. nazix* = (*sericans*, Fst., nec Gozis) ; FAUST, S. E. Z. 1, p. 229, n. n.

T. sericellus, Albania, p. 88, *discicollis*, Samos, p. 89, FAUST, Deutsche e. Z. 1889 ; *T. exiguus*, p. 95, *oertzeni*, p. 96, *sericans*, p. 97, Grece, FAUST, Deutsche e. Z. 1889 ; *T. reitteri*, Araxes Valley, FAUST, p. 206, Wien. ent. Z. viii ; *T. valens*, p. 131, *intrusus*, p. 132, *hauseri*, p. 133, Alka-Kul, FAUST, Deutsche e. Z. 1889 : n. spp.

Miccotrogus afflatus, p. 134, *auctus*, p. 135, *angustulus*, p. 136, Alka-Kul, FAUST, Deutsche e. Z. 1889, n. spp.

Pachytychius illectus, Afghanistan, FAUST, p. 229, Wien. ent. Z. viii, n. sp.

Sibynia lyrata, Alka-Kul, FAUST, p. 136, Deutsche e. Z. 1889, n. sp.

Gymnetronides to *Cholides*.

Gymnetron bipustulatum, Rossi, life-history ; BUDDENBERG, JB. nass. Ver. xli, pp. 20-22. *G. bipustulatum*, n. var., *germari* ; FAUST, S. E. Z. 1, p. 228.

Alcides fasciger, Madagascar, FAUST, S. E. Z. 1, p. 101, n. sp.

Aphiorumphus cavicollis, Ecuador, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 31, pl. iii, fig. 59, n. sp.

Archarius lugubris, pl. iii, fig. 57, *dorsalis*, fig. 58, Ecuador, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 30, n. spp.

Dionychus æquatorialis, Colombia, pl. iii, fig. 60, *grandicollis*, fig. 61, Peru, KIRSCH, p. 31, Abh. zool. Mus. Dresden, 1888-89, No. 4, n. spp.

Cryptorhynchides.

Mecocorynus humerosus, China, FAIRMAIRE, Ann. Soc. Ent. Fr. (6), ix, p. 53, n. sp.

Conotrachelus nenuphar, habits and natural history, ravages, enemies, &c. ; RILEY, Rep. 1888, pp. 57-79, pls. i & ii.

C. ulpersus, *ruficornis*, pl. iii, fig. 62, *æthiops*, fig. 63, p. 32, *carinulatus*, *linicollis*, fig. 64, *fasciolatus*, p. 33, Colombia and Ecuador, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, n. spp.

Pasurius, n. g., near *Conotrachelus*, for *P. dorsatus*, n. sp., Moupin ; FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 54.

Desmidophorus galericulus, Madagascar, FAIRMAIRE, C.R. ent. Belg. xxxiii, p. xcii ; *D. lacordairei*, p. 101, *infernalis*, p. 103, Madagascar, FAUST, S. E. Z. 1 : n. spp.

Haplocorynus, n. g., *Ithyporinorum*, for *H. excellens*, n. sp., Madagascar ; FAUST, p. 104, S. E. Z. 1.

Sphenosomus, n. g., *Sophrorhinorum*, for *Tragopus huoni*, Montr. ; FAUST, S. E. Z. 1, p. 73.

Acalles analcisoides, Ecuador, KIRSCH, p. 34, pl. iii, fig. 65, Abh. zool. Mus. Dresden, 1888-89, No. 4, n. sp.

Tyloderma fragariae, Riley, notes on its breeding and habits ; WEBSTER, Ins. Life, ii, pp. 109-112.

Merophorus, n. g., *Tylodinatorum* for *M. dimidiatus*, n. sp., New Caledonia ; FAUST, S. E. Z. 1, p. 69.

Perissops deportatus, New Caledonia, FAUST, S. E. Z. 1, p. 70, n. sp.

Petosiris conifer, New Caledonia, FAUST, S. E. Z. 1, p. 68, n. sp.

Torneuma syriacum, Beyrout, REITTER, p. 39, *Deutsche e. Z.* 1889; *T. theryi*, *subplanum*, Algeria, *grouvellei*, Nice, p. clviii, *sardoum*, Sardinia, p. clx, DESBROCHERS, Bull. Soc. Ent. Fr. (6) ix : n. spp.

Cryptorhynchus mangifera, notes on, metamorphosis; COTES, Ind. Mus. Notes, i, pp. 45 & 46, pl. iv, fig. 1.

C. ferruginosus, Colombia, KIRSCH, p. 34, *Abh. zool. Mus. Dresden*, 1888-89, No. 4, n. sp.

Macromerus carinicolis, Ecuador, KIRSCH, *Abh. zool. Mus. Dresden*, 1888-89, No. 4, p. 35, pl. iii, fig. 66, n. sp.

Mitrastethus brouni, n. n. for *N. bituberculatus*, auct. nec F.; FAUST, S. E. Z. 1, p. 72.

M. exsul, New Caledonia, FAUST, p. 71, S. E. Z. 1, n. sp.

Zygopides to Ceuthorrhynchides.

Idolusia montivaga, *squamigera*, Lord Howe I., OLLIFF, p. 91, Lord Howe Island, n. spp.

Celiodes quercus and allies, characters of, pp. 1-5; *C. fuliginosus* and *guttula* distinguished, p. 6; GERHARDT, *Z. Ent. Bresl.* xiv.

C. simulans, Euboea, FAUST, p. 90, *Deutsche e. Z.* 1889, n. sp.

Ceuthorrhynchus (*Celiodes*) *splendidus*, Algeria, BRISOUT, Bull. Soc. Ent. Fr. (6) ix, p. clvii, n. sp.

C. stachydis, note on characters and synonymy; FAUST, S. E. Z. 1, p. 231. *C. conspectus*, Gyll., note on; WEISE, p. 418, *Deutsche e. Z.* 1889. *C. napi*, habits; MURTFELDT, in Riley Rep. 1888, p. 136.

C. plastus, Araxes Valley, FAUST, p. 207, *Wien. ent. Z.* viii; *C. optator*, p. 138, *emeritus*, p. 139, Alka-Kul, FAUST, *Deutsche e. Z.* 1889 : n. spp. *Ceuthorrhynchidius effrons*, Alka-Kul, FAUST, p. 137, *Deutsche e. Z.* 1889, n. sp.

Poophagus subnudus, Circassia, REITTER, p. 70, *Wien. ent. Z.* viii, n. sp.

Rhinoneus castor, Fab., metamorphosis; BUDDEBERG, *J.B. nass. Ver.* xli, p. 28.

Baridiides.

Baris spitzyi, Hoch, noticed, p. 231, var. = (*nesapia*, Faust); FAUST, S. E. Z. 1, p. 232.

B. despicata, Araxes Valley, FAUST, p. 207, *Wien. ent. Z.* viii, n. sp.

Centrinus ferrinus, Parana, *auricollis*, Santarem, PASCOE, p. 324, *Ann. N. H.* (6) iv, n. spp.

Geraus, n. g., type *Centrinus senilis*, Gyll.; PASCOE, pp. 322 & 323, *Ann. N. H.* (6) iv.

Salmites, n. g., pp. 322 & 325, for *Centrinus querulus*, n. sp., Parana, p. 324; PASCOE, *Ann. N. H.* (6) iv.

Balbus, n. g., for *Centrinus conicollis*, Boh.; PASCOE, pp. 322 & 323, *Ann. N. H.* (6) iv.

Lydamis, n. g., for *Centrinus angulus*, Boh.; PASCOE, pp. 322 & 323, *Ann. N. H.* (6) iv.

Rhianus, n. g., for *Centrinus mexicanus*, Boh.; PASCOE, pp. 322 & 323, *Ann. N. H.* (6) iv.

Ortycus, n. g., pp. 322 & 325, for *Centrinus perdix*, n. sp., Parana, p. 325; PASCOE, Ann. N. H. (6) iv.

Dimesus, n. g., pp. 322 & 326, for *Centrinus geminus*, n. sp., Parana, p. 325; PASCOE, Ann. N. H. (6) iv.

Optatus, n. g., pp. 322 & 327, for *Centrinus palmaris*, n. sp., Mexico, p. 326; PASCOE, Ann. N. H. (6) iv.

Camelodes, n. g., for *Centrinus leachii*, Kirb.; PASCOE, p. 323, Ann. N. H. (6) iv.

Diasethus, n. g., for *Centrinus tumidus*, Boh., p. 323, with *C. cupreus*, n. sp., Parana, p. 327, PASCOE, Ann. N. H. (6) iv.

Pardisomus, n. g., pp. 323 & 328, for *Centrinus guttatus*, n. sp., Nauta, p. 327; PASCOE, Ann. N. H. (6) iv.

Telemus, n. g., for *Centrinus cestrotus*, Germ.; PASCOE, p. 323, Ann. N. H. (6) iv.

Sympages, n. g., pp. 323 & 328, for *Centrinus egregius*, n. sp., Para, p. 328; PASCOE, Ann. N. H. (6) iv.

Orissus, n. g., for *Centrinus meigenii*, Boh.; PASCOE, p. 323, Ann. N. H. (6) iv.

Xenius, n. g., for *X. curvirostris*, n. sp., Colombia; PASCOE, p. 329, Ann. N. H. (6) iv.

Enops, n. g., p. 329, for *E. interruptus*, n. sp., Parana, p. 330; PASCOE, Ann. N. H. (6) iv.

Calandrides.

Rhynchophorus ferrugineus, habits and metamorphoses; RIDLEY (712).

Anoxyopisthen, n. g., for *A. buttneri*, n. sp., W. Africa; KOLBE, p. 131, S. E. Z. 1.

Trymatoderus, n. g., near *Abacobius*, for *T. spongiicollis*, n. sp., China; FAIRMAIRE, p. 55, Ann. Soc. Ent. Fr. (6) ix.

Heterotoxus transatlanticus, Ecuador; KIRSCH, Abh. zool. Mus. Dresden, 1888-89, p. 35, pl. iii, fig. 67, n. sp.

Sphenophorus ochreus, Lec., life-history; WEBSTER, Ins. Life, ii, pp. 132-134, woodcuts. *S. cumingii*, Wat., figured; WATERHOUSE, Aid, pl. 181, fig. 8.

S. signiventris, Ecuador, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 36, pl. iii, fig. 68, n. sp.

Calandra oryzae, ravages in India; COTES, Ind. Mus. Notes, i, pp. 15-21.

Cossonides.

Tetratelmus perroudi, New Caledonia, FAUST, S. E. Z. 1, p. 74, n. sp.

Codiosoma spalix, larva figured and described; FOKKER, Tijdschr. Ent. xxxii, pp. 418-421, pl. xi, figs. 6-8.

Aphanocorynes procerus, Lord Howe I., OLLIFF, p. 91, Lord Howe Island, n. sp.

Cossonus lethargicus, Lord Howe I., OLLIFF, p. 92, Lord Howe Island, n. sp.

SCOLYTIDÆ.

[Cf. CHOLODKOVSKY (144), LOVENDAL (525), REITTER (672, 683), SCHWARZ (783).]

Burrows of *Scolytidae* and their evolution discussed ; CHOLODKOVSKI. (144).

Dendroctonus simplex, note on habits ; SCHWARZ, P. E. Soc. Washington, i, p. 175.

Phleotribus oleæ, Fabr., metamorphoses and habits ; XAMBEU, Rev. d'Ent. viii, p. 212. *P. liminaris*, Har., note on the type specimen : SCHWARZ, P. E. Soc. Washington, i, p. 149.

Polygraphus polygraphus, L., = (*grandiclava*, Th.) ; FAUVEL, Rev. d'Ent. viii, p. 69.

Cryphalus lederi, Circassia, REITTER, p. 93, Wien. ent. Z. viii, n. sp.

Cryphalops, n. subg. of *Cryphalus* ; REITTER, p. 94, Wien. ent. Z. viii.

Hypoborus firus, Fr., metamorphoses ; XAMBEU, Rev. d'Ent. viii, p. 274.

Xyleborus pyri, notes on its galleries ; SCHWARZ, P. E. Soc. Washington, i, p. 138.

Pityophthorus centralis, pulicarius, annectens, notes on ; SCHWARZ, P. E. Soc. Washington, i, pp. 163 & 164.

Thamnurgus brylinskyi, Araxes Valley, REITTER, p. 40, Deutsche e. Z. 1889, n. sp.

Tomicus elongatus, Denmark ; LOVENDAL, Ent. Med. ii, p. 23 ; *T. penidens*, Greece, REITTER, p. 374, Deutsche e. Z. 1889 : n. spp.

Lymantria, n. g., for *L. sepicola*, n. sp., Denmark ; LOVENDAL, Ent. Med. ii, p. 25.

Scolytus rugulosus, ravages of ; LINTNER, 4th Rep. pp. 103-107.

BRENTHIDÆ.

[Cf. FAIRMAIRE (242), SENNA (804).]

Cephalobarus macrocephalus, Dej., variation, &c. ; SENNA, Bull. Ent. Ital. xxi, pp. 33-35.

Stereodermus brevisrostris, Mexico, SENNA, Bull. Ent. Ital. xxi, p. 35, n. sp.

Rhaphidorrhynchus insculptus, Amazons, SENNA, Bull. Ent. Ital. xxi, p. 36, n. sp.

Cyphagogus appendiculatus, p. xcii, *sculptilis, costipennis*, p. xciii, Madagascar, FAIRMAIRE, C.R. ent. Belg. xxxiii, n. spp.

ANTHOTRIBIDÆ.

[Cf. FAIRMAIRE (236), FAUST (246), KIRSCH (455), OLLIFF (610), REITTER (672).]

Tribotrops vittatus, Ecuador, KIRSCH, Abh. zool. Mus. Dresden, 1883-89, No. 4, p. 36, pl. iii, fig. 69, n. sp.

Merarius, n. g. (*Acorynides*), for *M. davidis*, n. sp., Moupin ; FAIRMAIRE, p. 56, Ann. Soc. Ent. Fr. (6) ix.

Tropideres lacteocaudatus, Moupin, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 57, n. sp.

Litocerus madagascariensis, Madagascar, FAUST, S. E. Z. 1, p. 105 ; *L. balli*, Lord Howe I., OLLIFF, p. 92, Lord Howe Island : n. spp.

Tropideres interruptus, Ordubad, REITTER, p. 286, Deutsche e. Z. 1889, n. sp.

BRUCHIDÆ.

Mylabris auricilli, Tunis, BLANC, Bull. Soc. Ent. Fr. (6) ix, p. xliii, n. sp.

CERAMBYCIDÆ.

[Cf. BATES (35), BAUDI (39), BEDEL (46), BERG (51), BLACKBURN (74, 75), FAIRMAIRE (236, 238, 240, 242), FLEUTIAUX & SALLÉ (277), GAHAN (298, 299, 300), GANGLBAUER (305), HEYDEN (376), KIRSCH (455), KOLBE (465), LINELL (522), OATES (608), OLLIFF (610), PIC (629), POLL (640), REITTER (672), RITSEMA (724, 725, 727, 732), SÉMENOW (799), WATERHOUSE (1).]

Structure of clothing of tarsi in numerous genera ; PERO (627).

Prionides.

Polyarthron afrum, Cairo, BAUDI, Nat. Sicil. viii, p. 197, n. sp.

Psilotarsus latidens, Motsch., = (*Prionus angustatus*, Jak.) ; SÉMENOW, l. c.

Prionus asiaticus, Fald., ♀ = (*henkei*, Schauf.) ; SÉMENOW, Wien. ent. Z. viii, p. 62. *P. coriarius*, larva of as food ; PLANET, Le Nat. 1889, p. 280.

Cucosceles lucordairei, ♀ described, variation of ♂ ; GAHAN, pp. 375 & 376, Ann. N. H. (6) iv.

Eusyntheta, n. g., near *Achthophora*, p. 392, for *E. brevicornis*, n. sp., N. Borneo, p. 393 ; BATES, P. Z. S. 1889.

Priotyrranus mordax, variation of ♂, ♀ described : GAHAN, pp. 374 & 375, Ann. N. H. (6) iv.

Kinibalua, n. g., near *Dorycera*, for *K. megalops*, n. sp., N. Borneo ; BATES, p. 391, P. Z. S. 1889.

Macrodonia cervicornis, habits ; HARPER, Timohri (n.s.) ii, p. 76.

Euryassa, particulars as to its use as food ; LUMHOLZ, Among Cannibals, pp. 154, &c.

Tereticus rufulipennis, Madagascar, FAIRMAIRE, C.R. ent. Belg. xxxiii, p. xciii, n. sp.

Howea, n. g., for *H. angulata*, n. sp., Lord Howe I., pl. vi, fig. 8 ; OLLIFF, p. 93, Lord Howe Island.

Cerambycides.

Tetropium gracilicorne, Siberia, REITTER, p. 287, Deutsche e. Z. 1889, n. sp.

Hybometopia, n. g., near *Drymochaeres*, p. 282, for *H. sturcki*, n. sp., Utsch-Dere ; GANGLBAUER, Hor. Ent. Ross. xxiii, p. 285.

Oeme brunnea, Ecuador, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 37, pl. iii, fig. 70, n. sp.

Achryson scutellatum, Peru, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 37, n. sp.

Hemadius, n. g., near *Cerambyx*, for *H. aenochrous*, n. sp., China ; FAIRMAIRE, p. 57, Ann. Soc. Ent. Fr. (6) ix.

COLEOPTERA.

rows of *Scolytidae* and their evolution discussed ; CHOLODKOVSKY,

Proctonus simplex, note on habits ; SCHWARZ, P. E. Soc. Wash-
i, i, p. 175.

Acotribus oleæ, Fabr., metamorphoses and habits ; XAMBEU, Rev.
t. viii, p. 212. *P. liminaris*, Har., note on the type specimens ;
FARZ, P. E. Soc. Washington, i, p. 149.

raphus polygraphus, L., = (*grandiclava*, Th.) ; FAUVEL, Rev.
iii, p. 69.

us lederi, Circassia, REITTER, p. 93, Wien. ent. Z. viii, n. sp.
n. subg. of *Cryphalus* ; REITTER, p. 94, Wien. ent. Z. viii.

ficus, Pr., metamorphoses ; XAMBEU, Rev. d'Ent. viii,

notes on its galleries ; SCHWARZ, P. E. Soc. Wash-

minorus centralis, pulicarius, annectens, notes on ; SCHWARZ,
Washington, i, pp. 163 & 164.

rus plinskyi, Araxes Valley, REITTER, p. 40, Deutsche e. Z.

tus, Denmark ; LOVENDAL, Ent. Med. ii, p. 23 ; *T. pes-*
REITTER, p. 374, Deutsche e. Z. 1889 : n. spp.

antor, n. g., for *L. sepicola*, n. sp., Denmark ; LOVENDAL, Ent.
i. n. 25.

ravages of ; LINTNER, 4th Rep. pp. 103-107.

BRENTHIDÆ.

[*Cf.* FAIRMAIRE (242), SENNA (804).]

Cephalobarus macrocephalus, Dej., variation, &c. ; SENNA, Bull. Ent.
Ital. xxi, pp. 33-35.

Stereodermus brevivrostris, Mexico, SENNA, Bull. Ent. Ital. xxi, p. 35, n. sp.

Rhaphidorrhynchus insculptus, Amazons, SENNA, Bull. Ent. Ital. xxi,
p. 36, n. sp.

Cyphagogus appendiculatus, p. xcii, *sculptilis, costipennis*, p. xciii, Mada-
gascar, FAIRMAIRE, C.R. ent. Belg. xxxiii, n. spp.

ANTHOTRIBIDÆ.

[*Cf.* FAIRMAIRE (236), FAUST (246), KIRSCH (455), OLLIFF (610),
REITTER (672).]

Tribotropis vittatus, Ecuador, KIRSCH, Abh. zool. Mus. Dresden, 1888-89,
No. 4, p. 36, pl. iii, fig. 69, n. sp.

Merarius, n. g. (*Acorynides*), for *M. davidis*, n. sp., Moupin ; FAIR-
MAIRE, p. 56, Ann. Soc. Ent. Fr. (6) ix.

Tropideres lacteocaulatus, Moupin, FAIRMAIRE, Ann. Soc. Ent. Fr. (6)
ix, p. 57, n. sp.

Litocerus madagascariensis, Madagascar, FAUST, S. E. Z. 1, p. 105 ;
L. balli, Lord Howe I., OLLIFF, p. 92, Lord Howe Island : n. spp.

Tropideres interruptus, Ordubad, REITTER, p. 286, Deutsche e. Z.
1889, n. sp.

Musius, n. g., near *Logisticus*, p. xciv, for *M. quadrinodosus*, n. sp., Madagascar, p. xciv; FAIRMAIRE, C.R. ent. Belg. xxxiii.

Logisticus oberthurii, Madagascar, FAIRMAIRE, C.R. ent. Belg. xxxiii, p. xciv, n. sp.

Harimius, n. g., for *H. atripennis*, n. sp., Madagascar, FAIRMAIRE, p. xcvi, C.R. ent. Belg. xxxiii.

Pachysticus, n. g., for *P. crassipes*, n. sp., Madagascar; FAIRMAIRE, p. xciv, C.R. ent. Belg. xxxiii.

Pachyta oxyoma, Moupin, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 58, n. sp.

Gaurotes donacioides, Moupin, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 59, n. sp.

Vadonia bitliensis, Chev., redescribed; PIC, Bull. Soc. Ent. Fr. (6) ix, p. clxxv.

Leptura canadensis, structure of epipharynx; PACKARD, Psyche, v, p. 225. *L. cordigera*, n. var. *immaculata*; RAGUSA, Nat. Sicil. viii, p. 236. *L. reyi*, n. n. for *ochracea*, REY; HEYDEN, p. 203, Wien. ent. Z. viii. *L. bitlisiensis*, Chev., = (*cribricollis*, PIC); FAUVEL, Bull. Soc. Ent. Fr. (6) ix, p. lxxxix.

L. tripartita, Syria, HEYDEN, p. 329, Deutsche e. Z. 1889; *L. sepulchralis*, p. 63, *porphyrophora*, p. 64, Moupin, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix : n. spp.

Stenura basiplicata, p. 60, *lineigera*, p. 61, *stricticollis*, p. 62, *æneipennis*, p. 63, Moupin, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, n. spp.

Anoplodera rufipes, var., = (*Leptura kruperi*, Gangl.); REITTER, p. 375, Deutsche e. Z. 1889.

Cortodera pseudomophilus, Ordubad, REITTER, p. 40, Deutsche e. Z. 1889, n. sp.

Ophiostomis thoracica, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 465, n. sp.

Euryptera lateralis, Ol., structure of epipharynx; PACKARD, Psyche, v, p. 225.

E. melanophthisis, Corrientes, BERG, An. Un. B. Aires, vi, p. 108, n. sp.

Stenopterus rufus, with abnormally-formed hind tibia; GADEAU (297).

Phalota obscura, Port Lincoln, BLACKBURN, p. 454, P. Linn. Soc. N.S.W. (2) iv, n. sp.

Anteros and *Agapete*, synonymical note; BLACKBURN, p. 1467, P. Linn. Soc. N.S.W. (2) iii.

Pyresthes quinquesignatus, China, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 65, n. sp.

Hadrinus, n. g., "affinis *Cartalis*," p. xciii, for *H. cartalloides*, n. sp., Madagascar, p. xciv; FAIRMAIRE, C.R. ent. Belg. xxxiii.

Zonopterus, *Pachyteria*, *Aphrodisium*, list of the species; RITSEMA, Tijdschr. Ent. xxxii, pp. xxix-xxxi.

Z. magnificus, N. Borneo, BATES, P. Z. S. 1889, p. 392; *Z. consanguineus*, Himalaya, RITSEMA, Notes Leyd. Mus. xi, p. 10 : n. spp.

Aphrodisium de la touchii, full description; FAIRMAIRE, Tijdschr. Ent. xxxii, p. xxxii.

A. albardæ, Rits., figured, pl. x, fig. 3, Notes Leyd. Mus. xi.

Pachyteria vandepolli, Malacca, RITSEMA, p. 49, Notes Leyd. Mus. xi; figured, pl. x, fig. 2; *P. apicalis*, Borneo, POLL, p. 219, pl. x, fig. 1, Notes Leyd. Mus. xi, n. sp.

Mecaspis buttneri, W. Africa, KOLBE, S. E. Z. 1, p. 132, n. sp.

Callichroma chrysogaster, Rits., figured, pl. x, fig. 4, Notes Leyd. Mus. xi.

Bradynemis velutina, Wat., the hab. is Sumatra; RITSEMA, p. 246, Notes Leyd. Mus. xi.

Leontium tenuipes, China, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 64, n. sp.

Gauresthes, n. g., near *Helymaeus*, for *G. rufipes*, n. sp., N. Borneo; BATES, p. 392, P. Z. S. 1889.

Cheridamus, n. g., near *Closteromerus*, for *C. hypargyreus*, n. sp., Madagascar; FAIRMAIRE, C.R. ent. Belg. xxxiii, p. xciii.

Callidium abdominale and *femorale*, n. varr. of, described; STARCK, p. 312, Wien. ent. Z. viii.

Cyllene robinia, Forst., structure of epipharynx; PACKARD, Psyche, v, p. 225.

Glycobius speciosus, Say, ravages of; LINTNER, Rep. N. Y. Mus. xl, p. 103.

Clytus verbasci, L., synonymical note; GUILLEBEAU, Bull. Soc. Ent. Fr. (6) ix, p. xix.

C. vesparum, Caucasus, REITTER, p. 375, Deutsche e Z. 1889; *C. bifarius*, Asia Minor, HEYDEN, p. 329, Deutsche e Z. 1889; *C. eleodes*, Thibet, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 65; *C. (Xylotrechus) grumi*, Transcaspian region, SÉMENOW, Hor. Ent. Ross. xxiii, p. 402; n. spp.

Amphiroe sloanei, Victoria, BLACKBURN, p. 453, P. Linn. Soc. N.S.W. (2) iv, n. sp.

Leptocera coadnata, Madagascar, FAIRMAIRE, C.R. ent. Belg. xxxiii, p. xciii, n. sp.

Stenygra globicollis, Ecuador, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 38, pl. iv, fig. 72, n. sp.

Pteroplatus atroviolaceus, Colombia, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, pl. iv, fig. 73, n. sp.

Tragidion fulvipenne, oviposition; POPENOE, Ins. Life, ii, p. 192.

Trachyderes pellitus, Ecuador, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 39, pl. iv, fig. 74, n. sp.

Apatophysis komarowi, Transcaspian region, SÉMENOW, Hor. Ent. Ross. xxiii, p. 401, n. sp.

Mantitheus, n. g., near *Apatophysis*, p. lxxxix, for *M. pekinensis*, n. sp., China, p. xc; FAIRMAIRE, Bull. Soc. Ent. Fr. (6) ix.

Microtragus junctus, Australia, BLACKBURN, P. Linn. Soc. N.S.W. (2) iii, p. 1468, n. sp.

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Xyloteles segrez, Lord Howe I., OLLIFF, p. 94, Lord Howe Island, n. sp.

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Nanilla, n. g., near *Somatidia*, for *N. delauneyi*, n. sp., Guadeloupe, pl. viii, fig. 20; FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 467.

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Dorcadion scabricolle, n. var. *sewangensis*; REITTER, p. 41, Deutsche e. Z. 1889.

Neodorcadion calabricum, Sicily, REITTER, p. 41, Deutsche e. Z. 1889; *N. flaschneri*, Turkey, PIC, p. clxxv, Bull. Soc. Ent. Fr. (6) ix : n. spp.

Dolichoprosopis maculatus, Rits., var. noticed; POLL, p. 222, Notes Leyd. Mus. xi.

Pseudanhammus, n. g., for *P. keili*, n. sp., Sumatra; RITSEMA, p. 243, Notes Leyd. Mus. xi.

Monohammus sericeomicans, *sparsutus*, China, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 67, n. spp.

Tæniotes farinosus, injurious to cocoa; Timehri (n.s.) i, p. 354.

Melanauster pirouletii, China, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 66, n. sp.

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Freadelpha exigua, W. Africa, KOLBE, S. E. Z. 1, p. 132, n. sp.

Phymasterna rufo-castanea, Madagascar, FAIRMAIRE, C.R. ent. Belg. xxxiii, p. ix, n. sp.

Homelix sculptithorax, W. Africa, KOLBE, S. E. Z. 1, p. 132, n. sp.

Eumimetes bioculatus, Madagascar, FAIRMAIRE, C.R. ent. Belg. xxxiii, p. xcvi, n. sp.

Ranova lineigera, Madagascar, FAIRMAIRE, C.R. ent. Belg. xxxiii, p. viii, n. sp.

Hathliodes grammicus and *lactea*, notes on; BLACKBURN, pp. 1469 & 1470, P. Linn. Soc. N.S.W. (2) iii.

Micracantha desjardinsii, Madagascar, FAIRMAIRE, C.R. ent. Belg. xxxiii, p. xcvi, n. sp.

Eunidia batesii, Matabele Land, OLLIFF, in Oates' Matabele Land, ed. ii, p. 381, n. sp.

Adetus lherminieri, Guadeloupe, FLEUTIAUX & SALLÉ, p. 468, pl. viii, fig. 18, Ann. Soc. Ent. Fr. (6) ix, n. sp.

Ptericoptus guttatus, Colombia, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 40, pl. iv, fig. 75, n. sp.

Amblesithis seriepilosa, Ecuador, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 40, pl. iv, fig. 76, n. sp.

Hypomia grisea, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 469, n. sp.

Trachysomus huamboye, Ecuador, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 40, pl. iv, fig. 77, n. sp.

Cacostola ornata, Guadeloupe, FLEUTIAUX & SALLÉ, p. 470, pl. viii, fig. 19, Ann. Soc. Ent. Fr. (6) ix, n. sp.

Hippopsis monachica, B. Aires, BERG, An. Un. B. Aires, vi, p. 106, n. sp.

Nethinius, n. g., near *Phacellocera*, for *N. sanguinicollis*, *obscuripes*, *dimidiatipes*, *fulvipes*, *fulvescens*, n. spp., Madagascar; FAIRMAIRE, C.R. ent. Belg. xxxiii.

Steirastoma depressa injurious to cocoa ; Timehri (n.s.) i, p. 354.

Acanthoderes rufitarsis, Ecuador, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 41, n. sp.

Alcidion batesii, p. 41, pl. iv, fig. 78, *cozale*, fig. 79, p. 42, Colombia, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, n. sp.

Anisopodes andicola, Ecuador, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4, p. 42, pl. iv, fig. 80, n. sp.

Lepturges guadeloupensis, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 472 ; *L. argentinus*, S. America, BERG, p. 105, An. Un. B. Aires, vi : n. spp.

Cobelura vermicularis, Ecuador, KIRSCH, p. 43, Abh. zool. Mus. Dresden, 1888-89, No. 4, n. sp.

Illena meyricki, W. Australia, BLACKBURN, p. 455, P. Linn. Soc. N.S.W. (2) iv, n. sp.

Colobothea signativentris, Bahia, p. 387, *elongata*, Cayenne, p. 388, *brullei*, Santa Cruz, p. 389, *amena*, Bahia, *socia*, Brazil, p. 390, *disiccicollis*, Bahia, p. 391, GAHAN, Ann. N. H. (6) iii : n. spp.

Carneades vittata, Cuenca, p. 391, *bicincta*, Guadeloupe, p. 393, GAHAN, Ann. N. H. (6) iii, n. spp.

Agapanthia nigriventris, Afghanistan, WATERHOUSE, Tr. L. S. (2) v, p. 130, pl. xiv, fig. 16, n. sp.

Saperda, note on the structure of claws in ; GAHAN, Tr. E. Soc. 1889, p. 225. *S. scularis*, habits, oviposition ; FALLOU, Rev. Sci. Nat. App. xxxvi, p. 393.

Compsidia populnea, habits, &c. ; CHRÉTIEN, Le Nat. 1889, pp. 119 & 120.

Glenida suffusa, fig. 2, *cyaneipennis*, Gahan, fig. 3, figured, pl. 181 ; WATERHOUSE, Aid.

Glenea (sub *Saperda*) 14-*maculata*, Hope, noticed and redescribed, p. 222 ; *G. mutata*, n. n. for *G. mouhotii*, Thoms., Rev. Mag. Zool., *giraffa*, Dalm., = (*jucunda*, Th.), p. 225 ; GAHAN, Tr. E. Soc. 1889.

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Volumnia, most of the species in Munich Cat. should be referred to *Glenea* ; GAHAN, Tr. E. Soc. 1889, p. 225.

Phytocia affinis, metamorphoses ; XAMBEU, Rev. d'Ent. viii, pp. 215-217.

P. antoniae, Ordubad, p. 42, *adusta*, Erzeroum, p. 43, REITTER, Deutsche e. Z. 1889, n. spp.

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Calocosmus holosericeus, *melanurus* (*Amphionycha melanura*, Dej. Cat.), San Domingo, p. 395, *marginipennis*, Jamaica, p. 396, GAHAN, Ann. N. H. (6) iii, n. spp.

Amphionycha apicalis, p. 43, *annulifera*, p. 44, Ecuador, KIRSCH, Abh. zool. Mus. Dresden, 1888-89, No. 4; *A. nigrirentris*, Guadeloupe, FLEUTIAUX & SALLÉ, p. 472, pl. 8, fig. 21, Ann. Soc. Ent. Fr. (6) ix; *A. albomaculata* (Dej. Cat.), p. 396, *nigrocincta*, Brazil, *bicolor*, Ecuador, p. 397, *marginicollis*, Cayenne, p. 398, *procera*, S. Brazil, *A. (?) antiqua*, Brazil, p. 399, GAHAN, Ann. N. H. (6) iii: n. spp.

Erenica acutipennis (Chev.), Brazil, GAHAN, p. 400, Ann. N. H. (6) iii, n. sp.

Drycothea guadeloupensis, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 473, n. sp.

CHRYSOMELIDÆ.

[Cf. ALLARD (7, 8, 9, 10), BALY (25, 26, 27, 28), BLACKBURN (73, 74, 75), BUDDEBERG (112), DUVIVIER (208), FAIRMAIRE (236, 240), FLEUTIAUX & SALLÉ (277), HENKING (370), HEYDEN (376), HOEN (396), JACOBY (324, 414, 415), KESSLER (438), LEFÈVRE (490, 491, 492, 493, 494, 495, 496, 497), MARSEUL (550), REITTER (672, 684), RYBAKOW (753), SCHMIDT (773), WEISE (914, 915, 916, 917, 918, 919, 920), WHEELER (923).]

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Diaphanops meyricki, p. 458, *parallelus*, p. 459, W. Australia, BLACKBURN, P. Linn. Soc. N.S.W. (2) iv, n. sp.

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S. cambieri, E. Africa, DUVIVIER, C.R. ent. Belg. xxxiii, p. cxxviii; *S. papuana*, Port Moresby, JACOBY, Ent. M. M. xxv, p. 203: n. spp.

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Crioceris recens, Australia, BLACKBURN, p. 460, P. Linn. Soc. N.S.W. (2) iv, n. sp.

Megalopus buckleyi, Ecuador, JACOBY, Ent. M. M. xxv, p. 203, n. sp.

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Figures of the male forceps of *Olythrides*; WEISE, Deutsche e. Z. 1889, pl. ii, figs. 14-35, p. 417.

Labidostomis guerini, var., = (*trifoveolata*, Desbr.) ; WEISE, p. 412, Deutsche e. Z. 1889.

L. oertzeni, Rhodes, WEISE, p. 62, Deutsche e. Z. 1889 ; *L. heteromalla*, Smyrna, LEFÈVRE, Bull. Soc. Ent. Fr. (6) ix, p. cxix : n. spp.

Clytra laticollis, Rhodes, WEISE, p. 63, Deutsche e. Z. 1889 ; *C. annamita*, Saigon, LEFÈVRE, Ann. Soc. Ent. Fr. (6) ix, p. 288 : n. spp.

Gynandrophthalma flavicollis n. var. *picticollis* ; WEISE, p. 128, Deutsche e. Z. 1889.

G. russowi, Samarcand, HEYDEN, p. 330, Deutsche e. Z. 1889 ; *G. labilis*, japonica var. *mandarina*, China, WEISE, p. 579, Hor. Ent. Ross. xxiii ; *G. cochinchinensis*, Saigon, LEFÈVRE, Ann. Soc. Ent. Fr. (6) ix, p. 290 : n. spp.

Ezomis peplopteroides, Kan-ssu, WEISE, Hor. Ent. Ross. xxiii, p. 577, n. sp.

Coptocephala punctata, Spain, WEISE, Deutsche e. Z. 1889, p. 336 ; *C. jacobyi*, Lake Nyassa, LEFÈVRE, Bull. Soc. Ent. Fr. (6) ix, p. lxx : n. spp.

Proctophana fulvicollis, Panama, Jacoby, p. 81, pl. xxxvii, fig. 8, Biol. Centr. Am. Col. vi (1) Supp., n. sp.

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Cryptocephalini found on *Ceanothus americanus* ; CHITTENDEN, Ent. Am. v, p. 220.

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Aporocera apicalis, Saund., var. described; BLACKBURN, P. Linn. Soc. N.S.W. (2) iii, p. 1474.

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Chrysodina tibialis, *cribricollis*, Venezuela, LEFÈVRE, Ann. Soc. Ent. Fr. (6) ix, p. 330, n. spp.

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Mouhotina rufipes, Saïgon, LEFÈVRE, Ann. Soc. Ent. Fr. (6) ix, p. 293,
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A. pusilla, Cambodia, LEFÈVRE, Ann. Soc. Ent. Fr. (6) ix, p. 291 : n. spp.

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Verissus affinis, W. Africa, LEFÈVRE, Ann. Soc. Ent. Fr. (6) ix, p. 300, n. sp.

Oenaparis, n. g., *Pseudocolaspites*, for *O. nucea*, u. sp., Moupin ; FAIRMAIRE, p. 72, Ann. Soc. Ent. Fr. (6) ix.

Pseudocolaspis rubripes, Schauf., synonymical note ; WEISE, p. 59, Deutsche e. Z. 1889.

Rhyparida æneo-tincta, p. 1479, *mediopicta*, p. 1480, *amplicollis*, p. 1481, *punctulata*, *posticalis*, p. 1482, *piceitarsis*, *uniformis*, p. 1483, *herbacea*, p. 1484, *satelles*, *discopunctulata*, p. 1485, *interioris*, p. 1486, Australia, BLACKBURN, P. Linn. Soc. N.S.W. (2) iii, n. spp.

Eumolpus surinamensis, var. described ; LEFÈVRE, Ann. Soc. Ent. Fr. (6) ix, p. 335.

Colasposoma pulcherrimum, Baly, variation described ; LEFÈVRE, Ann. Soc. Ent. Fr. (6) ix, p. 292.

C. marginicollis, W. Africa, LEFÈVRE, Ann. Soc. Ent. Fr. (6) ix, p. 301, n. sp.

Euryops hühneli, Centr. Africa, LEFÈVRE, Bull. Soc. Ent. Fr. (6) ix, p. clx, n. sp.

Edusoides, n. g., for *E. pulcher*, n. sp., W. Australia ; BLACKBURN, P. Linn. Soc. N.S.W. (2) iv.

Myochrous curculionoides, Bahia, LEFÈVRE, Bull. Soc. Ent. Fr. (6) ix, p. xxi, n. sp.

Syagrus alluaudi, W. Africa, LEFÈVRE, Ann. Soc. Ent. Fr. (6) ix, p. 302, n. sp.

Corynodes plebeius, Sze-tschuan, WEISE, p. 593, Hor. Ent. Ross. xxiii ; *C. æmulus*, p. 297, *beauchenei*, p. 298, Tonkin, LEFÈVRE, Ann. Soc. Ent. Fr. (6) ix : n. spp.

Chloropterus grandis, Mongolia, WEISE, p. 595, Hor. Ent. Ross. xxiii, n. sp.

Chrysochus gonistoma, Mongolia, p. 592, *cyclostoma*, Kan-ssu, p. 593, WEISE, Hor. Ent. Ross. xxiii, n. spp.

Colaspoides pilicornis, p. 298, *fulripes*, *rugulosa*, p. 299, Tonkin, LEFÈVRE, Ann. Soc. Ent. Fr. (6) ix, n. spp.

Colaphus nitidicollis, Amdo, WEISE, p. 601, Hor. Ent. Ross. xxiii, n. sp.

Chrysomelides,

Gastroidea amæna, Mongolia, WEISE, p. 602, Hor. Ent. Ross. xxiii, n. sp.

Phædon tatrensis, p. 102, *szmolayi*, p. 103, Hungary, MARSEUL, L'Ab. xxvi, Mon. Chrysa, n. spp.

Plagioderma bicolor, Kan-ssu, WEISE, p. 606, Hor. Ent. Ross. xxiii ; *P. ornata*, Venezuela, JACOBY, P. Z. S. 1889, p. 268 : n. spp.

Lina tremulae, embryology ; GRABER, Denk. Ak. Wien, iv, pp. 119-122, pl. iv, figs. 28-34.

Chrysomela didymata, Scriba, metamorphosis, pp. 29-31, *hyperici*, id., pp. 31 & 32, *staphylea*, id., pp. 33 & 34; BUDDEBERG, J.B. *nass. Ver.* xli. *C. carnifex* n. var. *konowi* ; WEISE, p. 127, *Deutsche e. Z.* 1889.

C. altimontana, Centr. Asia, RYBAKOW, *Hor. Ent. Ross.* xxiii, p. 286, n. sp.

Oreina speciosissima, viviparous ; CALLONI, *Bull. Ent. Ital.* xxi, p. 46.

O. cacaliae n. var. *bohémica* ; WEISE, p. 127, *Deutsche e. Z.* 1889.

Semenovia, n. g., near *Chrysomela*, for *S. chalcona*, n. sp., AMDO ; WEISE, p. 605, *Hor. Ent. Ross.* xxiii.

Doryphora decemlineata, in Germany ; BÖHR (87) : embryology ; WHEELER (923).

D. simoni, Venezuela, JACOBY, P. Z. S. 1889, p. 267 ; *D. brazilensis*, St. Catharina, *piceofasciata* hab. ?, p. 204, *brunneolineata*, St. Catharina, p. 205, *undulato-fasciata*, Colombia, p. 206, JACOBY, *Ent. M. M.* xiv : n. spp.

Desmogramma decorata, Venezuela, JACOBY, P. Z. S. 1889, p. 268, n. sp.

Timarcha coriaria, structure of tarsal clothing ; PERO (627). *T. tenebriosa* and *violacea-nigra*, duration of life ; BUDDEBERG, J.B. *nass. Ver.* xli, pp. 42 & 43.

Polaninia, n. g., near *Cyrtanastes*, p. 603, for *C. polita*, n. sp., Sze-tschuan, p. 604 ; WEISE, *Hor. Ent. Ross.* xxiii.

Cyrtanastes coreyreus, Corfu, MARSEUL, L'Ab. xxvi, *Mon. Chrys.* p. 107, n. sp.

Chalcolampra adelaidae, p. 479, *kursti*, p. 480, *distinguenda*, p. 482, Australia, BLACKBURN, P. Linn. Soc. N.S.W. (2) iv, n. spp.

Calomela apicalis, p. 1489, *distinguenda*, *tarsalis*, p. 1490, Australia, BLACKBURN, P. Linn. Soc. N.S.W. (2) iii, n. spp.

Augomela acervata, Australia, BLACKBURN, p. 1488, P. Linn. Soc. N.S.W. (2) iii, n. sp.

Goniocena quadriplagiata, Moupin, FAIRMAIRE, *Ann. Soc. Ent. Fr.* (6) ix, p. 75, n. sp.

Amphimela postfasciata, Moupin, FAIRMAIRE, *Ann. Soc. Ent. Fr.* (6) ix, p. 73 ; *A. australis*, Brisbane, BLACKBURN, p. 1491, P. Linn. Soc. N.S.W. (2) iii : n. spp.

Halticiles.

Composition and classification of the subfamily discussed, and the N. American species monographed, all the genera and species being fully described ; HORN (396).

Pseudolampses, n. group, with *Pseudolampsis*, n. g., p. 174, for *Hypolampsis guttata*, Lec. ; HORN, *Tr. Am. Ent. Soc.* xvi.

Nisotra unicolor, Australia, BLACKBURN, p. 1493, P. Linn. Soc. N.S.W. (2) iii, n. sp.

Crepidodera rufipes, habits ; LINTNER, *Fourth Rep.* p. 101.

C. longula, Kansas, p. 240, *nitens*, Illinois, p. 243, HORN, *Tr. Am. Ent. Soc.* xvi ; *C. castanea*, Venezuela, JACOBY, P. Z. S. 1889, p. 274 : n. spp.

Podagrica semirufa, Küst., = (*rufa*, All.) ; WEISE, Deutsche e. Z. 1889, p. 419.

Hemiglyptus, n. g., for *H. basalis*, Cr. ; HORN, p. 237, Tr. Am. Ent. Soc. xvi.

Epitrix fulvicornis, p. 272, *venezuelensis*, p. 273, Venezuela, JACOBY, P. Z. S. 1889, n. spp.

Orthaltica melina, N. America, HORN, Tr. Am. Ent. Soc. xvi, p. 249, n. sp.

Leptotrix, n. g., for *L. recticollis*, Lec. ; HORN, p. 249, Tr. Am. Ent. Soc. xvi.

Sangaria haroldi, Venezuela, JACOBY, P. Z. S. 1889, p. 273, n. sp.

Italica saliceti, habits noticed ; WEISE, p. 112, Deutsche e. Z. 1889.

H. bimarginata, Say, habits and ravages ; LINTNER, Fourth Rep., pp. 96-101.

H. læviuscula, Sze-tschuan, p. 634, *deserticola*, Mongolia, *pamiranica*, Pamir, *globoicollis*, Erzeroum, p. 635, *viridula*, Batoum, *ciliciensis*, Tarsus, p. 636, WEISE, Hor. Ent. Ross. xxiii ; *H. australis*, p. 1493, *igneæ*, *ferruginis*, p. 1494, Australia, BLACKBURN, P. Linn. Soc. N.S.W. (2) iii ; *H. vicaria*, p. 222, *amæna*, p. 225, *marevagens*, p. 226, *opulenta*, *floridana*, p. 230, N. America, HORN, Tr. Am. Ent. Soc. xvi ; *H. (Graptodera) transversicollis*, Venezuela, JACOBY, P. Z. S. 1889, p. 271 : n. spp.

Graptodera nigro-viridis, S. Africa, *punctata*, *lucida*, W. Africa, p. 33, *inaequalis*, *senegalensis*, W. Africa, *madagascariensis*, Madagascar, *crassa*, Algeria, p. 43, ALLARD, Le Nat. 1889, n. spp.

Cacoscelis (?) *semifulva*, Venezuela, JACOBY, P. Z. S. 1889, p. 274, n. sp.

Hemiphrynus, n. g., for *Phrynocephala intermedia*, Jac. ; HORN, p. 213, Tr. Am. Ent. Soc. xvi.

Disonycha tenuicornis, Arizona, p. 203, *varicornis*, Texas, p. 210, *politula*, Arizona, p. 211, HORN, Tr. Am. Ent. Soc. xvi ; *D. lævipennis*, Caracas, JACOBY, P. Z. S. 1889, p. 272 : n. spp.

Lactica perraudieri, Cambodia, ALLARD, Ann. Soc. Ent. Fr. (6) ix, p. 304 ; *L. corallina*, Guadeloupe, FLEUTIAUX & SALLÉ, Ann. Soc. Ent. Fr. (6) ix, p. 477 : n. spp.

Hermæophaga mercurialis, F., metamorphoses ; BUDDERBERG, JB. nass. Ver. xli, pp. 35 & 36.

H. simoni, *subcostata*, p. 269, *haroldi*, *nitidicollis*, p. 270, JACOBY, P. Z. S. 1889, n. spp.

Diphaulaca bicolorata, N. America, HORN, p. 234, Tr. Am. Ent. Soc. xvi, n. sp.

Longitarsus suturalis, Marsh., = (*æneicollis*, Fald.), *nigrocillius*, Motsch., = (*subterlucens*, Foud.), p. 419, *longiseta*, n. n. for *nigriceps*, Foud., p. 420, WEISE, Deutsche e. Z. 1889 ; *L. niger*, p. 39, *tubidus*, p. 40, metamorphoses ; BUDDERBERG, JB. nass. Ver. xli.

L. lederi, Circassia, WEISE, p. 3, Wien. ent. Z. viii ; *L. aterimus*, Annam, ALLARD, Ann. Soc. Ent. Fr. (6) ix, p. 304 ; *L. heliophyti*, p. 278, *turbatus*, p. 279, *oregonensis*, *traductus*, *postremus*, p. 280, *vanus*, *occidentalis*, *bicolor*, p. 282, *montivagus*, p. 283, *erro*, *pygmaeus*, p. 284, *rufescens*, p. 285.

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Systenæ, n. group : HORN, Tr. Am. Ent. Soc. xvi, p. 268.

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Sutrea modesta, Cambodia, ALLARD, Ann. Soc. Ent. Fr. (6) ix, p. 306, n. sp.

Luperomorphus nobilis, Sze-tschuan, WEISE, p. 640, Hor. Ent. Ross. xxiii, n. sp.

Aphthona cyparissiae, Kch., p. 36, *nonstriata*, Göze, p. 37, metamorphoses; BUDDEBERG, J.B. nass. Ver. xli. *A. pseudacori*, habits noticed; WEISE, p. 112, Deutsche e. Z. 1889.

A. metallica, Darmstadt, WEISE, p. 415, Deutsche e. Z. 1889; *A. armeniaca*, Araxes Valley, WEISE, p. 260, Wien. ent. Z. viii; *A. splendida*, Kan-ssu, WEISE, p. 639, Hor. Ent. Ross. xxiii; *A. opaca, varians*, Cambodia, ALLARD, Ann. Soc. Ent. Fr. (6) ix, p. 305; *A. socia*, N. America, p. 304, HORN, Tr. Am. Ent. Soc. xvi; *A. regulata*, Venezuela, JACOBY, P. Z. S. 1889, p. 275 : n. spp.

Phyllotreta ochripes var. = (*caucasica*, Har.) ; WEISE, p. 419, Deutsche e. Z. 1889.

P. denticornis, p. 297, *ulkei, decipiens*, p. 298, *pusilla*, p. 302, N. America, HORN, Tr. Am. Ent. Soc. xvi, n. spp.

Tebalia, n. g., allied to *Oxygona*, for *T. caeruleata*, n. sp., Moupin; FAIRMAIRE, p. 83, Ann. Soc. Ent. Fr. (6) ix.

Chatocnema basalis, description, habits, p. 338, figured, pl., fig. 3; SHIPLEY, P. Cambr. Phil. Soc. vi.

C. sinuata, Kan-ssu, WEISE, p. 633, Hor. Ent. Ross. xxiii; *C. tristis*, Saigon, ALLARD, Ann. Soc. Ent. Fr. (6) ix, p. 307; *C. perturbata*, p. 257, *brunnescens*, p. 259, *amula*, p. 261, *opulenta*, p. 264, *ectypa*, p. 265, *dispar*, p. 267, N. America, HORN, Tr. Am. Ent. Soc. xvi : n. spp.

Podontia rufo-flava, China, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 73, n. sp.

Homophyla seriata, Blumenau, p. cxxix, *nigrita*, Therezopolis, *ferruginea*, Blumenau, p. cxxx, *amazona*, p. cxxxi, *antennata*, p. cxxxii, Amazons, *simillima*, Peru, p. cxxxiii, DUVIVIER, C.R. ent. Belg. xxxiii, n. spp.

Edionychis cavifrons, Madagascar, FAIRMAIRE, C.R. ent. Belg. xxxiii, p. ix; *E. amula*, p. 185, *tenuilineata*, p. 186, *jacobiana*, p. 189, Arizona, *ulkei*, Florida, p. 188, *flavida*, Texas, p. 190, HORN, Tr. Am. Ent. Soc. xvi; *E. graphica*, Venezuela, JACOBY, P. Z. S. 1889, p. 276 : n. spp.

Phydans, n. g., p. 198, for *P. bicolor*, n. sp., Texas, p. 199, pl. vi, fig. 10; HORN, Tr. Am. Ent. Soc. xvi.

Monoplatys (?) *obliteratus*, Venezuela, JACOBY, P. Z. S. 1889, p. 277, n. sp.

Euphenges (?) *subcostatus*, JACOBY, P. Z. S. 1889, p. 279, n. sp.

Rhinotmetus clarki, Blumenau, DUVIVIER, C.R. ent. Belg. xxxiii, p. cxxxiii, n. sp.

Physimerus simoni, Venezuela, JACOBY, P. Z. S. 1889, p. 278, n. sp.

Sparnus minutus, Venezuela, JACOBY, P. Z. S. 1889, p. 280, n. sp.

Omototus carinatus, Venezuela, JACOBY, P. Z. S. 1889, p. 277, n. sp.

Cerichrestus allardi, Peru, DUVIVIER, C.R. ent. Belg. xxxiii, p. cxxxiv, n. sp.

Argopus nigripes, Kan-su, WEISE, p. 642, Hor. Ent. Ross. xxiii, n. sp.

Sphæroderma punctata, Annam, ALLARD, Ann. Soc. Ent. Fr. (6) ix, p. 307, n. sp.

Dibolia intermedia, ravages of ; ORMEROD, Injur. ins. S. Afr. p. 35.

D. velox, *potanini*, China, WEISE, p. 643, Hor. Ent. Ross. xxiii ; *D. tepperi*, Australia, BLACKBURN, p. 1495, P. Linn. Soc. N.S.W. (2) iii ; *D. sinuata*, p. 307, *libonoti*, p. 308, N. America, HORN, Tr. Am. Ent. Soc. xvi : n. spp.

Megistops vandepolli, Blumenau, DUVIVIER, C.R. ent. Belg. xxxiii, p. cxxxv, n. sp.

Psylliodes valida, Circassia, WEISE, p. 2, Wien. ent. Z. viii ; *P. elegans*, p. 311, *sublævis*, p. 312, N. America, HORN, Tr. Am. Ent. Soc. xvi : n. spp.

Nonarthra nigricolle, p. 641, *nigriceps*, p. 642, China, WEISE, Hor. Ent. Ross. xxiii, n. spp.

Galerucides.

Aulacophora: Baly gives many notes and synonymical observations in correction of ALLARD's synopsis (cf. Zool. Rec. xv, Ins. Titles, No. 1); Tr. E. Soc. 1889, pp. 297-305.

A. insignita, Madagascar, FAIRMAIRE, C.R. ent. Belg. xxxiii, p. ix ; *A. armigera*, Murray I., p. 305, *apicicornis*, Sumatra, *diversa*, Borneo, p. 306, *biplagiata*, Solo-Sula, p. 307, BALY, Tr. E. Soc. 1889 ; *A. palmerstoni*, p. 1497, *australis*, p. 1498, Australia, BLACKBURN, P. Linn. Soc. N.S.W. (2) iii : n. spp.

Adorium laticlavum, China, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix, p. 74, n. sp.

Oides tepperi, p. 1495, *soror*, p. 1496, *silphomorphoides*, p. 1497, Australia, BLACKBURN, P. Linn. Soc. N.S.W. (2) iii, n. spp.

Malacosoma flaviventre, Motsch., referred to *Luperus* ; WEISE, p. 612, Hor. Ent. Ross. xxiii.

M. suturalis, Caffraria, ALLARD, C.R. ent. Belg. xxxiii, p. cii ; *M. bicolor*, Tabora, *rudepunctatum*, Natal, *cimeæ*, California, p. lxviii, *nigrum*, Zanguebar, p. lxix, ALLARD, C.R. ent. Belg. xxxiii : n. spp.

Phyllectrus ? *ceylanicus*, Saigon, p. lxxxii, *viridipennis*, Cochin China, p. lxxxiii, ALLARD, C.R. ent. Belg. xxxiii, n. spp.

Liroëtis, n. g., near *Phyllobrotica*, p. 607, for *L. æneipennis*, Kan-su, p. 608, *cæruleipennis*, Japan, p. 609, n. spp. ; WEISE, Hor. Ent. Ross. xxiii.

Ootheca cærulea, p. cii, *flavicollis*, p. ciii, Old Calabar, ALLARD, C.R. ent. Belg. xxxiii, n. spp.

Brachita, n. g., for *B. terminata*, p. ciii, *brevicollis*, *elegans*, *parva*, p. civ, Philippines, n. spp. ; ALLARD, C.R. ent. Belg. xxxiii.

Diabrotica vittata, Fab., structure of epipharynx ; PACKARD, Psyche v, p. 225.

D. 14-nokuta, Madagascar, FAIRMAIRE, C.R. ent. Belg. xxxiii, p. ix ;

D. simoni, p. 280, *fulvofasciata*, *estebanensis*, p. 281, *varicornis*, *obscurumaculata*, p. 282, *nigrodorsata*, p. 283, *simplicipennis*, *atomaria*, p. 284. Venezuela, JACOBY, P. Z. S. 1889; *D. guttifera*, Cayenne, *illigeri*, Amazons, *javeti*, Brazil, p. 251, *buqueti*, Cayenne, *westwoodi*, *nigritaris*, Amazons, *atrilineata*, *donckieri*, Brazil, *pectinicornis*, Cauca, p. 252, *volzemi*, *cruciata*, *borrei*, Brazil, *sordidipennis*, Cauca, *gestroi*, E. Peru, *caecipes*, Amazons, p. 253, *tarsalis*, Bahia, *excelsa*, *staudingeri*, *torta*, *corrugata*, *reticulata*, Cauca, p. 254, Baly, Ent. M. M. xxv; *D. contigua*, *melanopyga*, *extensa*, *nitidicollis*, p. 88, *clarkella*, *scutellata*, *piceicornis*, *viridans*, Brazil, *glaucina*, Cayenne, p. 89, *atromaculata*, Amazons, *12-signata*, Brazil, *vagrans*, Bolivia, *agrotæ*, *evanescens*, Ecuador, *confraternæ*, Para, p. 90, *limitata*, *tuberculata*, Ecuador, *hemixantha*, Upper Amazons, *interrupto-lineata*, *notaticollis*, Brazil, p. 91, *melancholica*, *zonula*, Ecuador, *unifasciata*, *spiloptera*, Brazil, *albomarginata*, Ecuador, p. 92, *albicincta*, *albopicta*, Peru, *limbatipennis*, Brazil, *cognata*, Ecuador, *simulans*, p. 93, *perspicua*, *alcyone*, *stali*, Amazons, *suaveola*, Cayenne, *discrepans*, p. 94, *aneiventris*, *bipartita*, Ecuador, *erythroptera*, Peru, *albidocincta*, Brazil, p. 95, Baly, P. Z. S. 1889 : n. spp.

Neobrotica inconstans, *dimidiaticornis*, Venezuela, JACOBY, P. Z. S. 1889 : n. spp.

Hoplosoma ventralis, Baly, = (*celebensis*, Jac., and *corniculata*, All.); Baly, Tr. E. Soc. 1889, p. 308.

Pyesia picta, Widi bay (*sic*), ALLARD, C.R. ent. Belg. xxxiii, p. cv; *P. cincta*, Peru, ALLARD, C.R. ent. Belg. xxxiii, p. lxxvi : n. spp.

Morphosphæra albipennis, Cambodia, ALLARD, C.R. ent. Belg. xxxiii, p. lxxvii; *M. albipennis*, Cambodia, ALLARD, Ann. Soc. Ent. Fr. (6) ix, p. 309; *M. (?) cincta*, W. Australia, BLACKBURN, Tr. R. Soc. S. Austr. xi, p. 177 : n. spp.

Agelastica alni, mode of fertilisation of egg : HENKING (371).

A. lineata, W. Australia, BLACKBURN, Tr. R. Soc. S. Austr. xi, p. 175; *A. impura*, Australia, BLACKBURN, p. 1499, P. Linn. Soc. N.S.W. (2) iii : n. spp.

Semacia, n. g. (*Mimastrites*), for *S. biplagiata*, n. sp., Moupin; FAIRMAIRE, p. 82, Ann. Soc. Ent. Fr. (6) ix.

Mimastra 8-punctata, Sze-tschuan, WEISE, p. 619, Hor. Ent. Ross. xxiii; *M. latimanus*, Annam, ALLARD, Ann. Soc. Ent. Fr. (6) ix, p. 308 : n. spp.

Cneorane violaceipennis, China, *alutacea*, E. India, p. lxx, *nigripes*, Mexico, p. lxxi, ALLARD, C.R. ent. Belg. xxxiii; *C. fossicollis*, *cæruleiceps*, p. 80, *intermedia*, *episcopalis*, *crassicornis*, p. 81, China, FAIRMAIRE, Ann. Soc. Ent. Fr. (6) ix : *C. rufipes*, Kan-su, WEISE, p. 620, Hor. Ent. Ross. xxiii : n. spp.

Æropa, n. g., near *Mimastra*, p. 621, for *A. maculata*, n. sp., Sze-tschuan, p. 622, WEISE, Hor. Ent. Ross. xxiii.

Apophyllia bipunctata, *consanguinea*, p. lxxii, *borrei*, *maculicollis*, *viridinitens*, p. lxxiii, *scutellaris*, S. Africa, *nigroviolacea*, Rio Pongo, p. lxxiv, ALLARD, C.R. ent. Belg. xxxiii; *A. duvivieri*, p. cv, *bifasciata*, p. cvi, S. Africa, ALLARD, C.R. ent. Belg. xxxiii : n. spp.

Megalognatha bicostata, *ruficollis*, S. Africa, ALLARD, p. lxxv, C.R. ent. Belg. xxxiii, n. spp.

Nancita, n. g. (*Antiphites*), for *N. alterna*, n. sp., Philippines; ALLARD, p. cvi, C.R. ent. Belg. xxxiii.

Antipha, *punctata*, *quadriplagiata*, *marginella*, Philippines, *unifusciata*, Cambodia, p. cviii, *brunnea*, Malacca, *pallida*, Cochin China, *tibialis*, *terminata*, Philippines, p. cviii, *nigra*, Malacca, *flavescens*, Ceylon, *obsoleta*, Celebes, p. cix, ALLARD, C.R. ent. Belg. xxxiii, n. spp.

Protymena, n. g., near *Antipha*, p. 628, for *P. pallidipennis*, n. sp., Kan-su, p. 630; WEISE, Hor. Ent. Ross. xxiii.

Glechonis, n. g., near *Cerotoma*, p. 630, for *G. rubripennis*, n. sp., Szechuan, p. 632; WEISE, Hor. Ent. Ross. xxiii.

Sumatrasia tibialis, Malacca, ALLARD, p. cix, C.R. ent. Belg. xxxiii, n. sp.

Scelida flava, Argentine Republic, ALLARD, C.R. ent. Belg. xxxiii, p. lxxvii, n. sp.

Chthoneis suturalis, *univittata*, Brazil, ALLARD, C.R. ent. Belg. xxxiii, p. lxxvii, n. spp.

Luperus cyanipennis, Küst., note on; WEISE, Deutsche e. Z. 1889, p. 416.

L. cous, I. of Cos, WEISE, p. 64, Deutsche e. Z. 1889; *L. testaceus*, Cambodia, ALLARD, Ann. Soc. Ent. Fr. (6) ix, p. 309; *L. femoralis*, Tasmania, ALLARD, C.R. ent. Belg. xxxiii, p. lxxviii; *L. marginatus*, Venezuela, JACOBY, P. Z. S. 1889, p. 289; *L. (Calomicrus) ictericus*, p. 609, *capito*, p. 610, *æneofuscus*, *lineatus*, p. 612, *ænescens*, p. 613, *punctulatus*, p. 614, *potanini*, China, *bicarinatus*, Japan, p. 615, *lemoides*, *jejunos*, p. 616, *iniquus*, p. 617, *flavimanus*, China, p. 618, WEISE, Hor. Ent. Ross. xxiii : n. spp.

Allophyla, n. g., near *Galeruca*, p. 624, for *A. aurora*, n. sp., Kan-su, p. 626; WEISE, Hor. Ent. Ross. xxiii.

Galeruca viburni, metamorphoses, oviposition, &c.; KESSLER, Ber. Ver. Cassel, xxxv, pp. 54-63. *G. pomonæ* n. var. *cretica*; WEISE, Deutsche e. Z. 1889.

G. circassica, Fischl, REITTER, p. 104, Wien. ent. Z. viii, n. sp.

Lochmæa semenowi, Central Asia, RYBAKOW, Hor. Ent. Ross. xxiii, p. 288; *L. tropica*, Venezuela, JACOBY, P. Z. S. 1889, p. 287 : n. spp.

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- ytes*, monograph of ; HANDLIRSCH (361). The synonymy given in paper is not recorded below.
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- us raddei*, Transcaspian region, HANDLIRSCH, Verh. z.-b. Wien, xxxix, 1; *S. terminus*, p. 134, pl. xiv, fig. 17, *tages*, p. 135, fig. 20, Afghanistan- KIRBY, Tr. L. S. (2) v : n. spp.

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- Astatus scapularis*, Araxes Valley, KOHL, Ann. Hofmuseum Wien, iv, p. 194 ; *A. tegularis*, Mongolia, MORAWITZ, Hor. Ent. Ross. xxiii, p. 134 : n. spp.
- Pison ater*, nest noticed ; RUDOW, Soc. Ent. iii, p. 170.
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ICHNEUMONIDÆ.

Ichneumonides.

Ichneumon luctatorius, *extensorius*, note on, p. 1401, *balteatus*, description of, p. 1402; THOMSON, Opusc. ent. xiii. *I. extensorius* ♂, p. 286, *mordax* ♂, p. 287, *ammonius*, p. 290, notes on; KRIECHBAUMER, Ent. Nachr. xv. *I. aries*, p. 203, *humilis*, p. 204, *variegatorius*, p. 205, males of described; KRIECHBAUMER, Ent. Nachr. xv. *I. sarcitorius*, L., var. described; TOSQUINET, Ann. Ent. Belg. xxxiii, p. 127. *I. ruficentris*, Br., fig. 1, *versabilis*, Cr., fig. 2, figured; SCUDDER, Butt. New England, iii, pl. 88.

I. pulchellatus, England, BRIDGMAN, Tr. E. Soc. 1889, p. 411; *I. gerstaeckeri*, Salzburg, KRIECHBAUMER, Ent. Nachr. xv, p. 142; *I. nigratarsis*, Munich, KRIECHBAUMER, Ent. Nachr. xv, p. 201 : n. spp.

Amblyteles johansonii (?), ♂ of described; KRIECHBAUMER, Ent. Nachr. xv, p. 288.

A. latibilis, p. 127, *æmulus*, p. 129, E. Siberia, TOSQUINET, Ann. Ent. Belg. xxxiii, n. spp.

Psilomastax mactator, Wladiwostock, TOSQUINET, Ann. Ent. Belg. xxxiii, p. 132, n. sp.

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Hoplismenus morulus, Say, figured; SCUDDER, Butt. New England, iii, pl. 88, fig. 9.

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Platylabus transversus, England, BRIDGMAN, Tr. E. Soc. 1889, p. 413, n. sp.

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Classification and description of the Swedish species and genera of *Ichneumonides pneustici*; HOLMGREN (392).

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Phæogenes varicolor, variation noticed ; BRIDGMAN, *Tr. E. Soc.* 1889, p. 413.

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Cryptides.

Hemiteles nitidus, England, BRIDGMAN, *Tr. E. Soc.* 1889, p. 416 ; *H. lycææ*, N. America, HOWARD, in Scudder's *Butt. New England*, iii, p. 1880 : n. spp.

Pezomachus pulicarius, Gr., ♂ described ; BRIDGMAN, *Tr. E. Soc.* 1889, p. 418. *P. corruptor*, F., sexes, and probable synonymy ; BRIDGMAN, *Ent. M. M.* xxv, p. 185.

Ophionides.

Ophion undulatus, its sting : MAGRETTI, *Le Nat.* 1889, p. 85.

O. macrurus, L., note on ; FALLOU, *Bull. Soc. Ent. Fr.* (6) ix, p. cxxxii. *O. bilineatus*, Say, = (*tityri*, Pack), figured, pl. 88, fig. 8 ; SCUDDER, *Butt. New England*, iii.

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Campoplex incompletus, England, BRIDGMAN, *Tr. E. Soc.* 1889, p. 420, n. sp.

Limneria fugitiva, Say, the *Lepidoptera* it attacks ; LINTNER, *Rep. N. Y. Mus.* xl, pp. 90 & 91.

L. (Onorga) fasciata, p. 422, *submarginata*, p. 423, *L. (Angitia) annulipes*, p. 424, *crassa*, p. 425, *scolice*, p. 426, *albonotata*, p. 427, *aculeata*, p. 428, *L. (Anilasta) teucarii*, p. 429, Britain, BRIDGMAN, *Tr. E. Soc.* 1889 ; *L. limenitidis*, N. America, HOWARD, in Scudder's *Butt. New England*, iii, p. 1883, pl. 88, fig. 5 : n. spp.

Charops decipiens, Gr., host of ; BRIDGMAN, *Ent. M. M.* xxv, p. 185.

Porizon, the species classified and described ; THOMSON (856).

P. caudatulus, p. 1364, *gracillimus*, *lericeps*, *anurus*, p. 1365, Scandinavia, *flicornis*, Bavaria, p. 1366, THOMSON, Opusc. ent. xiii, n. spp.

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Tryphonides.

Stilbops, Förster, and *S. retula*, Gr., redescribed; THOMSON, Opusc. ent. xiii, pp. 1427 & 1428.

Sychnoleter, n. subg. of *Euryproctus*, type *Mesoleptus geniculosus*, Gr.; THOMSON, Opusc. ent. xiii, p. 1430.

Phobetus, n. subg. (but treated as genus) of *Euryproctus*, p. 1430, with *P. liopleuris*, n. sp., Scandinavia, p. 1431; THOMSON, Opusc. ent. xiii.

Ipoclonus, n. subg. of *Euryproctus*, THOMSON, Opusc. ent. xiii, p. 1432.

Euryproctus crassicornis, p. 1433, *exareolatus*, *inferus*, p. 1435, *nitidulus*, p. 1436, Scandinavia, THOMSON, Opusc. ent. xiii; *E. coralis*, Italy, COSTA, Atti Acc. Napoli (2) iii, No. 2, p. 6, pl. ii, fig. 6 : n. spp.

Mesoteius bisignatus, Italy, COSTA, Atti Acc. Napoli (2) iii, No. 2, p. 7, pl. ii, fig. 7, n. sp.

Polyblastus uncinatus, England, BRIDGMAN, Tr. E. Soc. 1889, p. 433, n. sp.

Bassus festatorius, Sicily, COSTA, Atti Acc. Napoli (2) iii, No. 2, p. 5, pl. ii, fig. 5; n. sp.

Metopius venustus, Chabarofka, TOSQUINET, Ann. Ent. Belg. xxxiii, p. 139, n. sp.

Triphon nigricarpus referred to *Ezenterus*; COSTA, Atti Acc. Napoli (2) iii, No. 2, p. 12.

Athenarus, n. g., *Catoglyptides*, for *A. crassifemur*, Scandinavia, n. sp.; THOMSON, Opusc. ent. xiii, p. 1437.

Pimplides.

Glypta, revision of the species of; THOMSON (856). *G. erratica*, Cr., figured, pl. 88, fig. 7; SCUDDER, Butt. New England, iii.

G. parvicaudata, Scotland, BRIDGMAN, Tr. E. Soc. 1889, p. 435; *G. fractigena*, Europe, *crenulata*, France, p. 1334, *xanthognatha*, Scandinavia, *tegularis*, France, p. 1335, *nigriventris*, p. 1336, *heterocera*, *caudata*, p. 1337, Scandinavia, *tenuicornis*, Europe, p. 1340, *nigroplica*, p. 1341, *brevipetiolata*, *scutellaris*, p. 1344, *crassitarsis*, *tenuitarsis*, p. 1346, *breviventris*, p. 1347, *varicoxa*, p. 1348, Scandinavia, *microcera* (= *consimilis*, Tasch.), Harz,

p. 1350, *filicornis*, Europe, p. 1351, *rufipes*, *nigricornis*, Scandinavia, p. 1353, THOMSON, Opusc. ent. xiii : n. spp.

Meniscus simplex, Wladiwostok, TOSQUINET, Ann. Ent. Belg. xxxiii, p. 137, n. sp.

Lissonota, diagnostic and taxonomical notices of many European species ; THOMSON, Opusc. ent. xiii, pp. 1414-1425.

L. obsoleta, p. 436, *distincta*, p. 437, *transversa*, *trochanterata*, p. 438, England, BRIDGMAN, Tr. E. Soc. 1889 ; *L. impressifrons*, p. 1419, *palpalis*, p. 1422, *basalis*, p. 1424, *nigridens*, p. 1425, Scandinavia, THOMSON, Opusc. ent. xiii : n. spp.

Heterolabis, n. g., p. 18, for *H. crassula*, p. 19, *aberrans*, p. 21, *petiolata*, p. 22, *marginata*, p. 23, n. spp., Centr. Europe ; KRIECHBAUMER, Ent. Nachr. xv.

Pimpla, note on, with definitions of some of Förster's genera, viz., *Itopectis*, p. 1408, *Apechthis*, p. 1410, *Delomerista*, *Tromatobia*, *Epiurus*, p. 1412 ; THOMSON, Opusc. ent. xiii. *P. annulipes*, Br., figured, pl. 88, fig. 6 ; SCUDDER, Butt. New England, iii.

Pimpla rufipleura, Britain, BIGNELL, P. E. Soc. 1889, p. xv, n. sp.

Itopectis clavicornis, Scandinavia, THOMSON, Opusc. ent. xiii, p. 1409, n. sp.

Xylonomus brachylabis, Europe, KRIECHBAUMER, Ent. Nachr. xv, p. 75, n. sp.

Odontomerus punctulatus and *quercinus*, Th., notes on ; KRIECHBAUMER, Ent. Nachr. xv, p. 74.

O. geniculatus, Centr. Europe, KRIECHBAUMER, Ent. Nachr. xv, p. 73, n. sp.

Rhyssa alpestris, note on its variation ; KRIECHBAUMER, Ent. Nachr. xv, p. 316. *R. superba* and *clavata*, characters and synonymy ; KRIECHBAUMER, Ent. Nachr. xv, pp. 156-163.

Microtritus, n. g., p. 307, for *M. apicalis*, n. sp., Cayenne, p. 308 ; KRIECHBAUMER, Ent. Nachr. xv.

Certonotus, n. g., for *C. varius*, n. sp., Australia ; KRIECHBAUMER, Ent. Nachr. xv, p. 308.

Lissopimpla, n. g., p. 309, for *L. 8-guttata*, *10-notata*, *hemorrhoidalis*, n. spp., Australia, p. 310 ; KRIECHBAUMER, Ent. Nachr. xv.

Camptotypus, n. g., for *C. sellatus*, *bicolor*, n. spp., Australia ; KRIECHBAUMER, Ent. Nachr. xv, p. 311.

Thalessa emarginata, ♂ described, *austriaca*, Techek, and *leucographa* are probably the same species ; KRIECHBAUMER, Ent. Nachr. xv, pp. 140-142. *T. lunator*, habits, &c. ; LINTNER, Fourth Rep. pp. 35-42.

T. præcellens, Wladiwostock, TOSQUINET, Ann. Ent. Belg. xxxiii, p. 134, n. sp.

Cryptopimpla, Tasch., and *C. microtamia*, Gr., redescribed ; THOMSON, Opusc. ent. xiii, p. 1426.

Leptocryptus ruficaudatus, Bridg., characters noticed ; BRIDGMAN, Tr. E. Soc. 1889, p. 415.

Agriotypus armatus, Curt., life-history, distribution ; Klapálek (457) ; also Ent. M. M. xxv, p. 434 : observations on ; MÜLLER, Zool. Jahrb. Abth. f. Syst. iv, pp. 1132-1134.

Apterophygus (?) *paradoxus*, England, BRIDGMAN, Tr. E. Soc. 1889, p. 417, n. sp.

BRACONIDÆ.

MARSHALL (551) continues his monograph of European *Braconidæ*, dealing with *Chelonus* and *Apanteles*.

Vipio coloradensis, N. America, ASHMEAD, P. U. S. Nat. Mus. xi, p. 611, n. sp.

Bracon siculus, ♂ ♀ described; STEFANI, Nat. Sicil. viii, p. 194.

B. uromelas, p. 8, pl. ii, fig. 8, *flicauda*, p. 9, fig. 9, Sardinia, COSTA, Atti Acc. Napoli (2) iii, No. 2; *B. agrili*, p. 612, *kæbeli*, *rugosiventris*, p. 613, *atripectus*, p. 614, *montanensis*, *alaskensis*, *schwazii*, p. 615, *arizonensis*, *cecidomyia*, p. 616, *gastroileæ*, *pissodis*, p. 617, *bucculatricis*, *xantho-notus*, p. 618, *analcidis*, *vernoniæ*, *junci*, p. 619, *juncicola*, *pomifoliellæ*, p. 620, *euuræ*, *juglandis*, *tortricicola*, p. 621, *trifolii*, *atricollis*, p. 622, *navalensis*, *gelechiæ*, p. 623, *notaticeps*, *cookii*, p. 624, N. America, ASHMEAD, P. U. S. Nat. Mus. xi: n. spp.

Exothecus magnificus, Texas, ASHMEAD, P. U. S. Nat. Mus. xi, p. 624, n. sp.

Rhyssipolis carinatus, Texas, *orchesiæ*, Michigan, ASHMEAD, p. 625, P. U. S. Nat. Mus. xi, n. spp.

Spathius sequoiæ, California, ASHMEAD, p. 625, P. U. S. Nat. Mus. xi, n. sp.

Dimeris rufipes, Indiana, ASHMEAD, p. 626, P. U. S. Nat. Mus. xi, n. sp.

Doryctes longicauda, p. 626, *texanus*, Texas, *mellipes*, Missouri, p. 627, ASHMEAD, P. U. S. Nat. Mus. xi, n. spp.

Rhyssalus atriceps, *similis*, *loxotenix*, p. 628, *sclandriæ*, *trilineatus*, p. 629, *oscinidis*, *carinatus*, p. 630, N. America, ASHMEAD, P. U. S. Nat. Mus. xi, n. spp.

Oncophanes melleus, Washington, ASHMEAD, p. 630, P. U. S. Nat. Mus. xi, n. sp.

? *Petalodes politus*, Michigan, ASHMEAD, p. 631, P. U. S. Nat. Mus. xi, n. sp.

Pelecystoma lutea, host of: BRIDGMAN, Ent. M. M. xxv, p. 433.

Rhogas delicatus, *fumipennis*, *texanus*, Cr., referred to *Heterogamus*; ASHMEAD, p. 632, P. U. S. Nat. Mus. xi.

R. harrisina, *pubescens*, p. 632, *geometræ*, *platypterygis*, *simillimus*, p. 633, *nolophanæ*, *ceruræ*, p. 634, N. America, ASHMEAD, P. U. S. Nat. Mus. xi, n. spp.

Tetrastrophopyx, n. g. (*Cheloninæ*), for *Rhogas pilosus*, Cr.; ASHMEAD, p. 634, P. U. S. Nat. Mus. xi.

Chelonus lavernæ, *pallidus*, *nigripennis*, N. America, ASHMEAD, p. 635, P. U. S. Nat. Mus. xi, n. spp.

Ascogaster flaviceps, Texas, ASHMEAD, p. 636, P. U. S. Nat. Mus. xi, n. sp.

Apanteles butalidis, p. 451, *ononidis*, p. 461, *chrysostictus*, p. 466, *astrarches*, p. 471, England, MARSHALL, in André's Species Hym. iv; *A. edwardsii*, p. 1901, *cyaniridis*, p. 1903, *argynnidis*, *koebeli*, p. 1904,

flavicornis, p. 1905, *emarginatus*, p. 1906, *junoniae*, p. 1907, *pholisora*, p. 1909, N. America, RILEY, in Scudder's Butt. New England, iii : n. spp.

Schizoprymnus americanus, Texas, ASHMEAD, p. 636, P. U. S. Nat. Mus. xi, n. sp.

Urosigalphus, n. g., p. 637, for *U. armatus*, p. 637, *robustus*, p. 638, n. spp., N. America; ASHMEAD, P. U. S. Nat. Mus. xi.

Microgaster carinata, Pack., figured, pl. 88, fig. 11; SCUDDER, Butt. New England, iii.

Agathis imperialis, note on; COSTA, Atti Acc. Napoli (2) iii, No. 2, p. 11.

Paragathis, n. g., for *Microdus thoracicus*, Cr.; ASHMEAD, p. 638, P. U. S. Nat. Mus. xi.

Microdus sanctus, Say, figured, pl. 88, fig. 10; SCUDDER, Butt. New England, iii.

M. grapholithæ, *albocinctus*, *aciculatus*, N. America, ASHMEAD, p. 639, P. U. S. Nat. Mus. xi, n. spp.

Orgilus terminalis, *rileyi*, N. America, ASHMEAD, p. 640, P. U. S. Nat. Mus. xi, n. spp.

Perilitus americana, N. America, on *Megilla*, RILEY, Ins. Life, i, p. 338; *P. gastrophysæ*, Washington, ASHMEAD, p. 641, P. U. S. Nat. Mus. xi : n. spp.

Wesmaelia rileyi, N. America, ASHMEAD, p. 641, P. U. S. Nat. Mus. xi, n. sp.

Meteorus coquillettii, *acopsidis*, *floridanus*, p. 642, *orchesia*, N. America, *euchromia*, Venezuela, p. 643, ASHMEAD, P. U. S. Nat. Mus. xi, n. spp.

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SESSILIVENTRES.

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The plates accompanying SCUDDER's work (784) are classified as follows :—i-x, butterflies in colour ; xi-xvii, butterflies in black ; xviii-xxii, maps of geographical distribution ; xxiii-xxvii, male abdominal appendages ; xxviii-xlii, neuration of the wings ; xliii-xlv, scale patches and folds of the wing membrane found in the male butterfly ; xlvi-li, *Andro-*

conia, or scales peculiar to the male sex; lii-lx, side views of butterflies, showing appendages of the head and thorax (excepting the wings); lxi, miscellaneous structural details of the imago; lxii, internal anatomy of *Anosia plexippus*; lxiii, embryology of *Euvanessa antiopa*; lxiv-lxvi, eggs in colour and in black; lxvii-lxix, micropyles of eggs; lxx-lxxiii, caterpillars at birth; lxxiv-lxxvii, mature caterpillars; lxxviii-lxxx, heads of caterpillars at different stages; lxxxi-lxxxii, nests of caterpillars; lxxxiii-lxxxv, chrysalids in colour and in outline; lxxxvi-lxxxvii, miscellaneous structural details, mostly of the early stages; lxxxviii & lxxxix, *Hymenopterous* and *Dipterous* parasites; for list of the subjects connected with *Rhopalocera* discussed in the digressive essays included in Scudder's work, see "Titles" (781).

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Discophora simplex, Palawan, STAUDINGER, p. 42, Deutsche e. Z. Lep. 1889, n. sp.

Tenaris horsfieldii n. var. *plateni*; STAUDINGER, p. 43, Deutsche e. Z. Lep. 1889. *T. honrathi* n. var. *ida*; HONRATH, B. E. Z. xxxiii, p. 164.

T. occulta, Kina Balu, SMITH, p. 316, Ann. N. H. (6) iii; *T. staudingeri*, N. Guinea, HONRATH, B. E. Z. xxxiii, p. 163, pl. ii, fig. 2; *T. fimbriata*, p. 160, *barbata*, p. 161, *affinis*, p. 162, Louisiade Arch., KIRBY, Ann. N. H. (6) iv : n. spp.

Clerome plateni, Palawan, STAUDINGER, p. 44, Deutsche e. Z. Lep. 1889, n. sp.

Æmona pealii, W.-M., is the wet-season form of *Æ. amathusia*; DOHERTY, J. A. S. B. lviii, p. 124.

SATYRIDÆ.

Notes on the classification and phylogeny of Butterflies, with special reference to *Satyrina*; EDWARDS (219).

Classification and characters of the genera, *Elymnias* being included; SCHATZ & RÖBER, Exot. Schmett. pp. 195, *et seq.*

Mode of pupation; CHRÉTIEN, Bull. Soc. Ent. Fr. (6) ix, p. cxxx.

Zophoessa ramadera figured; NICÉVILLE, J. A. S. B. lvii, pl. xiii, fig. 3.

Lethe tristigmata, Elw., ♀ described, p. 163, pl. A, fig. 4; J. Bomb. N. H. Soc. iv.

L. naga, Assam, DOHERTY, J. A. S. B. lviii, p. 123, pl. x, fig. 4; *L. butleri*, p. 99, pl. viii, fig. 3, *naias*, p. 100, fig. 4, Kiukiang, LEECH, Tr. E. Soc. 1889 : n. spp.

Melanitis leda, varietal note ; STAUDINGER, p. 35, Deutsche e. Z. Lep. 1889.

M. aculeata, Nilgiris, HAMPSON, J. A. S. B. lvii, p. 351 ; *M. ponapensis*, Caroline Is., MATHEW, Tr. E. Soc. 1889, p. 311 : n. spp.

Neonympha mitchellii, Michigan, FRENCH, Canad. Ent. xxi, p. 25, n. sp.

Euptychia cleophes, clinas, Mexico, GODMAN & SALVIN, p. 352, Ann. N. H. (6) iii, n. spp.

Ragadia crinia, habits, &c. ; SKERTCHLY, Nature, xl, p. 10.

Erebia : ELWES gives catalogue of the species, admitting 57, and a large number of critical observations on the species, variation, synonymy, &c. ; Tr. E. Soc. 1889, pp. 317-342. Notes on the synonymy of numerous species ; BUTLER, Tr. E. Soc. 1889, pp. xvii-xxii. *E. medusa*, localities noticed ; DEMAISON, Bull. Soc. Ent. Fr. (6) ix, p. cxx. *E. myops* var. *tekkensis* figured ; Rom. Mem. v, pl. i, figs. 3a & b. *E. fasciata, discoidalis*, figured ; EDWARDS, Butt. N. Am. 3rd series, *Erebia*, ii.

E. herzi, lena, Siberia, *melanops*, Samarcand, CHRISTOPH, Hor. Ent. Ross. xxiii, p. 299, n. spp.

Argyrophinga antipodum, variation of, and its causes ; SMITH, Ent. xxii, pp. 37-39.

Chionobas macounii, egg and young larva described ; BEUTENMÜLLER, Canad. Ent. xxi, p. 160 : full-grown larva ; FLETCHER, Ins. Life, ii, pp. 45 & 46, woodcut. *C. jutta*, habits of larva ; FYLES, Canad. Ent. xxi, p. 12.

Eneis, Hb., the name invalid, *Chionobas* has priority ; EDWARDS, Canad. Ent. xxi, p. 63. *Æ. palæarcticus*, Stgr., note on ; ALPHÉRAKY, Rom. Mem. v, pp. 80 & 81.

Eneis ? (*Satyrus* ?) *palæarcticus*, Stgr. (*pumilus*, Feld., var. ?), note on ; STAUDINGER, S. E. Z. i, p. 20, ? n. sp.

Arge galathea, preparatory stages ; EDWARDS, Canad. Ent. xxi, pp. 61 & 62, pl.

Melanargia halimede, variation of discussed, p. 101, varr. figured, pl. viii, figs. 5 & 6 ; LEECH, Tr. E. Soc. 1889.

Satyrus autoon var. *extrema*, p. 116, *dryas* var. *paupera*, p. 117, described ; ALPHÉRAKY, Rom. Mem. v. *S. fidia*, L., n. var. *tryssii* ; CHRIST, MT. schw. ent. Ges. viii, p. 98. *S. parisatis* n. var. *lata* ; CHRISTOPH, Rom. Mem. v, p. 8.

Pararge dumetorum var. *fulvescens* described ; ALPHÉRAKY, Rom. Mem. v, p. 118. *P. adrasta*, Hb., var. described ; FUCHS, JB. nam. Ver. xlii, p. 195.

Epinephele janira, L., var. *fortunata* described, p. 222, figured, pl. xi, fig. 4 ; ALPHÉRAKY, Rom. Mem. v.

Neosatyrus boisduvalii = (*hahni*, Mab.) ; BERG, Bull. Soc. Ent. Fr. (6) ix, p. cexl.

Mycalasis malsarida, Butl., var. = (*hasiana*, Moore) ; NICÉVILLE, J. A. S. B. lvii, p. 273. *M. orseis*, p. 36, *mineus, blasius, tagala*, p. 37, variation of in Palawan ; STAUDINGER, Deutsche e. Z. Lep. 1889.

M. regalis, Kiu-kiang, LEECH, p. 102, pl. viii, figs. 2 & 2a, Tr. E. Soc. 1889 ; *M. interrupta*, Solomon Is., SMITH, Ent. M. M. xxv, p. 299 ; *M. (Samauta) misenus*, Sikkim, NICÉVILLE, J. Bomb. N. H. Soc. iv, p. 164, pl. A, fig 8 : n. spp.

Neorina lowii n. var. *princesa*; STAUDINGER, p. 36, Deutsche e. Z. Lep. 1889.

Erites medura n. var. *ochreana*; STAUDINGER, p. 38, Deutsche e. Z. Lep. 1889.

Ypthima baldus, Fab., variation and synonymy; LEECH, Tr. E. Soc. 1889, p. 103.

Y. jocularia, E. India, SWINHOE, P. Z. S. 1889, p. 396; *Y. striata*, Nilgiris, HAMPSON, J. A. S. B. lvii, p. 349; *Y. lycus* = (*motschulskii*, M. & N., olim), Khasi Hills, NICÉVILLE, J. Bomb. N. H. Soc. p. 165, pl. A, fig. 2 : n spp.

Ctenonympha semenovi, Alph., figured, Rom. Mem. v, pl. iv, fig. 7, described, p. 82. *C. pamphilus* and *tiphon*, characters noticed; MEVES, Ent. Tidskr. x, p. 159. *C. iphis* var. noticed; ZIEGLER, B. E. Z. xxxiii, p. 1, S.B. *C. amaryllis*, Cr., varr. *ordossi* and *evanescens* described, p. 118, *paronina*, Alph., described, p. 119, figured, pl. v, fig. 8, *sinica*, Alph., noticed, p. 121, figured pl. v, fig. 7; ALPHÉRAKY, Rom. Mem. v.

Argyronympha rubianensis, ulava, Solomon Is., SMITH, Ent. M. M. xxv, p. 299, n. spp.

Lymanopoda cinna, Guatemala, GODMAN & SALVIN, Ann. N. H. (6) iii, p. 353, n. sp.

Geirocheilus tritonias, Edw., figured; EDWARDS, Butt. N. Am. 3rd ser., *Geirocheilus* 1.

ELYMNIIDÆ.

Elymnias panthera, n. var. *parce*; STAUDINGER, p. 39, Deutsche e. Z. Lep. 1889.

E. harterti, Malacca, HONRATH, B. E. Z. xxxiii, p. 165, pl. ii, fig. 3; *E. kongra*, Kina Balu, SMITH, p. 317, Ann. N. H. (6) iii; *E. albofasciata*, Palawan, STAUDINGER, p. 39, Deutsche e. Z. Lep. 1889; *E. bornemanni*, Banggaja, RIBBE, p. 183, pl. iii, figs. 1 & 2, Deutsche e. Z. Lep. 1889 : n. spp.

Dyctis pealii, ♀ described and figured; DOHERTY, J. A. S. B. lviii, p. 124, pl. x, fig. 3.

ERYCINIDÆ.

Libytheinæ, subfam. defined, pp. 749-753; SCUDDER, Butt. New England, i.

Libythea narina, God., fig. 21, *antipoda*, Feld., fig. 22, figured, pl. xxx; SEMPER, Reisen Philipp. ii, v. *L. geoffroyi* n. var. *philippina*, described; STAUDINGER, p. 87, Deutsche e. Z. Lep. 1889.

Dodona aponata, Philippines, SEMPER, Reisen Philipp. ii, v, p. 156, n. sp.

Abisara gerontes, Fab., noticed and figured, pl. ii, fig. 4 & 5, *geryon*, Stdgr., figured, pl. i, figs. 3 & 4; DEWITZ, Ent. Nachr. xv, p. 105.

A. palawana, Palawan, STAUDINGER, p. 90, Deutsche e. Z. Lep. 1889, n. sp.

Tazila haquinus n. var. *palawanicus*; STAUDINGER, p. 91, Deutsche e. Z. Lep. 1889.

- Hypatus*, Hb., defined, pp. 753-755; *bachmanni*, with metamorphoses, illustrated and described, pp. 760-766; SCUDDER, Butt. New England, i.
- Calephelis* defined, pp. 783-785; *C. borealis* described, pp. 788-791, figured, pl. vi, fig. 2, &c.; SCUDDER, Butt. New England, ii.
- Eurygona cheles*, Chiriqui, GODMAN & SALVIN, p. 356, Ann. N. H. (6) iii, n. sp.
- Lymnas gynaceas*, Mexico, GODMAN & SALVIN, Ann. N. H. (6) iii, p. 356, n. sp.
- Emesis brimo*, Chiriqui, GODMAN & SALVIN, Ann. N. H. (6) iii, n. sp.
- Bacotis nesca*, Chiriqui, GODMAN & SALVIN, p. 356, Ann. N. H. (6) iii, n. sp.
- Lemonias idmon*, Chiriqui, GODMAN & SALVIN, Ann. N. H. (6) iii, p. 357, n. sp.

LYCENIDÆ.

Lycanida, characters of, pp. 767-772, and of the two subfamilies *Lycanina*, pp. 791-798, and *Lemoniina*, pp. 773-783; SCUDDER, Butt. New England, ii.

Notes on the classification of *Lycanida*, with special reference to the egg; DOHERTY, J. A. S. B. lviii, pp. 409-415.

The tribes *Theclidi*, pp. 798-801, *Lycanidi*, pp. 902 & 905, *Chrysophanidi*, pp. 970-975, discussed; SCUDDER, Butt. New England, ii.

Mimacraea krausi, Trop. Africa, DEWITZ, Ent. Nachr. xv, p. 106, pl. i, fig. 1, n. sp.

Tingra (sub *Pentila*) *petreia*, Hew., = (*tripunctata*, Druce), p. 32, figured, pl. viii, figs. 7 & 8; SMITH & KIRBY, Rhop. ex. African *Lycanida*.

Tingra lasti, figs. 1-4, *mombasa*, fig. 9-12, Mombasa, SMITH & KIRBY, Rhop. ex. African *Lycanida*, p. 31, pl. viii, n. spp.

Liptena bicoloria, Congo, CAPRONNIER, C.R. ent. Belg. xxxiii, p. cxxi; *L. semirufa*, Gold coast, SMITH & KIRBY, Rhop. ex. African *Lycanida*, p. 33, pl. viii, figs. 5 & 6 : n. spp.

Miletus philippus, Palawan, STAUDINGER, p. 92, pl. i, fig. 2, Deutsche e. Z. Lep. 1889, n. sp.

Feniseca, Gr., defined, pp. 1009-1014, and *F. tarquinius* monographed, pp. 1016-1026; SCUDDER, Butt. New England, ii.

Polyommatus phlæas varr. noticed; OBERTHUR, Bull. Soc. Ent. Fr. (6) ix, p. lxxvi. *P. phœnicurus* var. *scintillans*; CHRISTOPH, Rom. Mem. v, p. 5, pl. i, figs. 2, a, b. *P. doris*, var. described; FUCHS, JB. nass. Ver. xlii, p. 193.

P. subpallidus, Queensland, LUCAS, P. R. Soc. Queensl. vi, p. 117, n. sp. *Epidemia*, Scud., pp. 982 & 983, and *E. epixanthe*, pp. 985-989, described, &c.; SCUDDER, Butt. New England, ii.

Hoedes, Dalm., defined, pp. 990-994, *H. hypophleas* described and illustrated, pp. 998-1009; SCUDDER, Butt. New England, ii.

Chrysophanus, Hb., pp. 972-975, and *C. thoe*, pp. 977-981, described and illustrated; SCUDDER, Butt. New England, ii.

C. susanus, Beloochistan, SWINHOE, P. Z. S. 1889, p. 397, n. sp.

Chrysorhynchia punicea, p. 134, *mendeche*, p. 135, Mombasa, SMITH, Ann. N. H. (6) iii, n. spp.

Lycæna pseudargiolus, its relations with ants; NICÉVILLE, J. Bomb. N. H. Soc. iii, p. 166, pl. xxvii. *L. cyllarus*, varietal note; JONES, Ent. M. M. xxv, p. 211. *L. prosecusa* var. *duplex* figured, Rom. Mem. v, pl. iv, figs. 5, a, b. *L. agnata*, Stgr. (*christophi* var. ?), note on; STAUDINGER, S. E. Z. 1, p. 19. *L. hylas*, var. noticed; ZIEGLER, B. E. Z. xxxiii, p. 1, S.B. *L. argus* varr., pp. 105 & 106, *pheretes* var., p. 107, described; ALPHÉRAKY, Rom. Mem. v. *L. astrarche* var. *canariensis*, p. 258, pl. iv, figs. 7 & 8, *icarus* var. *icarinus*, figs. 2 & 3, figured; BLACHIER, Ann. Soc. Ent. Fr. (6) ix. *L. webbianus*, Br., figured, pl. xi, figs. 2, a, b, c; Rom. Mem. v. *L. rozus*, God., varr. described, p. 95, *nora*, *hermus*, Feld. synonymy noticed, p. 96, *ancyra*, *beroë*, Feld., p. 98, *ælianus*, Fab., p. 101, *pupsa*, Horsf., p. 102, synonymy noticed; STAUDINGER, Deutsche e. Z. Lep. 1889.

L. melania, p. cxx, *cassioides*, *albiatriata*, p. cxxi, Congo, CAPRONNIER, C.R. ent. Belg. xxxiii; *L. pephredo*, S. Africa, TRIMEN, S. Afr. Butt. iii, p. 389; *L. potanini*, Mongolia, ALPHÉRAKY, Rom. Mem. v, p. 104, pl. v, fig. 4; *L. moorei*, Kiukiang, LEECH, p. 109, pl. vii, fig. 4, Tr. E. Soc. 1889; *L. (Castalius) ulysseus*, p. 95, pl. i, fig. 5, *L. ardeola*, p. 97 (on p. 164 this is said to be *tombugensis*, Rüb.), *amphyssina*, p. 100 (on p. 164, said to be *osias*, Rüb.), Palawan, STAUDINGER, Deutsche e. Z. Lep. 1889, n. spp.: *L. oranigra*, Queensland, LUCAS, P. R. Soc. Queensl. vi, p. 118; *L. scintillata*, p. 157, *miskini*, p. 158, *exilis*, p. 159, *conjungens*, p. 160, Australia, LUCAS, P. R. Soc. Queensl. vi; *L. lulu*, Fiji Is., &c.; MATHEW, Tr. E. Soc. 1889, p. 312 : n. spp.

Rusticus, Hb., pp. 957-962, and *R. scudderii*, pp. 964-969, described and illustrated; SCUDDER, Butt. New England, ii.

Hypolycæna thecloides, n. var. *philippina*; STAUDINGER, p. 103, Deutsche e. Z. Lep. 1889.

Lampides elpas, God., injurious to cardamoms, metamorphosis; NICÉVILLE, Ind. Mus. Notes, i, pp. 11-14, pl. i, fig. 5.

L. phaseli, Claremont Is., Queensland, MATHEW, Tr. E. Soc. 1889, p. 312, n. sp.

Nacaduba ardates, Moore, pl. 32, figs. 27-30, larva and pupa, pl. B, fig. 2, figured; SEMPER, Reisen Philipp. ii, v.

Zizera alsulus, H.-Sch., figs. 23-25, *otis*, Fab., figs. 19-22, figured, pl. xxxii; SEMPER, Reisen Philipp. ii, v.

Chilades ? maputi, Philippines, SEMPER, p. 170, pl. xxxii, fig. 26, Reisen Philipp. ii, v, n. sp.

Nomiades, Hb., and *N. couperi*, described and illustrated; SCUDDER, pp. 948-956, Butt. New England, ii.

Everes, Hb., and *E. comyntrus*, illustrated, described; SCUDDER, pp. 905-918, Butt. New England, ii.

E. umbriel, Lower Tenasserim, DOHERTY, J. A. S. B. lviii, p. 433, pl. xxiii, fig. 1, n. sp.

Cyaniris, Dalm., pp. 918-923, and *C. pseudargiolus*, pp. 927-947, described and illustrated; SCUDDER, Butt. New England, ii. *C. pupsa*, Horsf., n. var. *ilucea*; HAMPSON, J. A. S. B. lvii, p. 356. *C. caryta*, Feld., figs. 5-10, *transpectus*, Moore, figs. 11-13, *dilectus*, Moore, fig. 4, figured, pl. xxxii; SEMPER, Reisen Philipp. ii, v.

O. philippina, Philippines, p. 168, pl. xxxii, figs. 14-18, SEMPER, Reisen Philipp. ii, v; *O. melana*, Lower Tenasserim, DOHERTY, J. A. S. B. lviii, p. 434, pl. xxiii, fig. 13 : n. spp.

Thysonotis schaeffera, Esch., figured, pl. xxxii, figs. 1-3; SEMPER, Reisen Philipp. ii, v.

T. regina, Louisiade Arch., KIRBY, p. 163, Ann. N. H. (6) iv, n. sp.

Gerydus melanion, Feld., figs. 13 & 14, *irroratus*, Druce, figs. 10-12, figured, pl. xxxi; SEMPER, Reisen Philipp. ii, v.

G. drucei, Philippines, SEMPER, Reisen Philipp. ii, v, p. 162, pl. xxxi, figs. 8 & 9; *G. aucon*, p. 438, pl. xxiii, fig. 8, *croton*, p. 439, fig. 9, Lower Tenasserim, DOHERTY, J. A. S. B. lviii : n. spp.

Paragerydus horsfieldi, Moore, figured, pl. xxxi, figs. 18-20; SEMPER, Reisen Philipp. ii, v.

P. nigrilus, p. 164, pl. xxxi, fig. 15, *punctatus*, p. 165, figs. 16 & 17, Philippines, SEMPER, Reisen Philipp. ii, v; *P. tarus*, Lower Tenasserim, DOHERTY, J. A. S. B. lviii, p. 437 : n. spp.

Malais, n. g. (*Gerydine*), for *M. sriaca*, Dist.; DOHERTY, J. A. S. B. lviii, p. 436.

Allotinus nivalis, Druce, and *Logania subtrigosa*, Moore, are probably one species; DOHERTY, J. A. S. B. lviii, p. 437. *A. fallax*, Feld., figured, pl. xxxi, figs. 23-26; SEMPER, Reisen Philipp. ii, v.

A. felderi, Philippines, SEMPER, Reisen Philipp. ii, v, p. 163, pl. xxxi, fig. 22; *A. (Logania) distanti*, Palawan, STAUDINGER, p. 93, pl. i, fig. 3, Deutsche e. Z. Lep. 1889 : n. spp.

Logania malayica, Dist., fig. 3, *obscura*, figs. 4 & 5, pl. xxxi, figured; SEMPER, Reisen Philipp. ii, v.

L. distanti, Philippines, SEMPER, Reisen Philipp. ii, v, p. 161, pl. xxxi, figs. 6, 7, & 21, n. sp.

Spalgis pharnus, Feld., figured, pl. xxxi, fig. 2; SEMPER, Reisen Philipp. ii, v.

S. strigatus, Philippines, SEMPER, Reisen Philipp. ii, v, p. 160, pl. xxxi, fig. 1, n. sp.

Hypochrysops hecalius, ♂ described; MISKIN, p. 1516, P. Linn. Soc. N.S.W. (2) iii.

H. eucides, p. 1517, *olliffi*, p. 1518, Australia, MISKIN, P. Linn. Soc. N.S.W. (2) iii, n. spp.

Strymon, Hb., defined, pp. 802-804; *S. titus* described, and metamorphoses illustrated, pp. 809-815; SCUDDER, Butt. New England, ii.

Erora, Scud., defined, pp. 815-817; *E. lata* described, &c., pp. 819-822; SCUDDER, Butt. New England, ii.

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Uranotes, pp. 846-848, and *U. melinus*, pp. 850-855, described and illustrated; SCUDDER, Butt. New England, ii.

Mitura, Scud., pp. 856-859, and *M. damon*, pp. 861-867, described and illustrated; SCUDDER, Butt. New England, ii.

Thecla, the New England species illustrated and monographed; SCUDDER, pp. 868-902, Butt. New England, ii. *T. rubi*, var. noticed; BANKES,

Ent. M. M. xxv, p. 306. *T. ezimia*, FIXS., and *grandis*, FELD., note on; LEECH, p. 110, Tr. E. Soc. 1889.

T. pratti, KIUKIANG, LEECH, p. 110, pl. vii, fig. 4, Tr. E. Soc. 1889; *T. inflammata*, CHINA, ALPHÉRAKY, p. 102, pl. v, fig. 3, Rom. Mem. v; *T. alcestis*, SOLOMON IS., SMITH, Ent. M. M. xxv, p. 300 [cf. COCKERELL, t. c. p. 382] : n. spp.

Arhopala aida, E. India, NICÉVILLE, J. Bomb. N. H. Soc. iv, p. 168, pl. A, fig. 1; *A. pastorella*, p. 418, pl. xxiii, fig. 12, *duessa*, fig. 6, *perissa*, fig. 11, p. 419, *mirabella*, p. 420, *belphebe*, fig. 18, p. 421, *hellenora*, fig. 7, p. 422, Lower Tenasserim, DOHERTY, J. A. S. B. lviii : n. spp.

Apporasa atkinsonii, HEW., note on; DOHERTY, J. A. S. B. lviii, p. 423. *Flos*, n. g., p. 412, type *F. apidanus*, CR., with *F. artegai*, n. sp., TENASSERIM, p. 423, pl. xxiii, fig. 5; DOHERTY, J. A. S. B. lviii.

Surendra florimel, Lower Tenasserim, DOHERTY, J. A. S. B. lviii, p. 424, pl. xxiii, figs. 4 & 17, n. sp.

Biduanda cinesoides, MALAY PEN., NICÉVILLE, J. Bomb. N. H. Soc. iv, p. 166, pl. A, fig. 7, n. sp.

Zephyrus zoa, SIKKIM, NICÉVILLE, J. Bomb. N. H. Soc. iv, p. 167, pl. A, fig. 3; *Z. dohertii*, HIMALAYA, NICÉVILLE, J. A. S. B. lvii, p. 278, pl. xiv, figs. 1 & 2 : n. spp.

Acesina aberrans, TENASSERIM, NICÉVILLE, J. A. S. B. lvii, p. 279, pl. xiv, figs. 3 & 4, n. sp.

Zarona jasoda, BURMA, NICÉVILLE, J. A. S. B. lvii, p. 280, pl. xiv, fig. 5, n. sp.

Aphæzus hutchinsonii = (*zanzibarensis*, SMITH); TRIMEN, p. 413, S. Afr. Butt. iii. *A. pseudozeritis* = (*Chloroselas esmeralda*, BUTL.); TRIMEN, p. 414, S. Afr. Butt. iii.

A. zanzibarensis, MOMBASA, SMITH, p. 136, Ann. N. H. (6) iii; *A. rukma*, p. 281, pl. xiv, fig. 5, *rukmini*, fig. 8, *sani*, fig. 7, p. 282, SIKKIM, NICÉVILLE, J. A. S. B. lvii : n. spp.

Horaga rana, ANDAMAN I., NICÉVILLE, J. A. S. B. lvii, p. 283, pl. xiv, fig. 10, n. sp.

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Tajuria istroidea, ♂ described and figured, p. 286, pl. xiv, fig. 14; NICÉVILLE, J. A. S. B. lvii.

T. donatani, TENASSERIM, NICÉVILLE, J. A. S. B. lvii, p. 287, pl. xiv, fig. 15, n. sp.

Chliaria merguia, Lower Tenasserim, DOHERTY, J. A. S. B. lviii, p. 427, pl. xxiii, fig. 2, n. sp.

Jalmenus evagoras, DON., habits noticed; BARNARD, Viet. Nat. v, p. 168.

J. illidgei, BRISBANE, LUCAS, P. R. Soc. Queensl. vi, p. 156, n. sp.

Pseudodipsas helena, figures, pl. x, figs. 2 & 3, description and note on neuration, p. 391; SNELLEN, Tijdschr. Ent. xxiii.

P. fumidus, BRISBANE, MISKIN, P. R. Soc. Queensl. vi, p. 264; *P. (?) modesta*, PALAWAN, STAUDINGER, p. 104, pl. i, fig. 7, Deutsche e. Z. Lep. 1889 : n. spp.

Pithecopa fulgens, ASSAM, DOHERTY, J. A. S. B. lviii, p. 127, pl. x, fig. 6, n. sp.

Iolaus silanus, Mombasa, SMITH, Ann. N. H. (6) iii, p. 137, n. sp.

Poritia, characters of, p. 428, *P. hewitsoni* n. var. *tavoyana*, p. 429 ; DOHERTY, J. A. S. B. lviii.

P. plateni, Palawan, STAUDINGER, p. 104, pl. i, fig. 8, Deutsche e. Z. Lep. 1889, n. sp.

Massaga, n. g., near *Deramas*, type *Poritia pediada*, Hew. ; DOHERTY, J. A. S. B. lviii, p. 417. *Massaga pediada*, Hew., p. 430, pl. xxiii, fig. 15, *potina*, Hew., p. 431, fig. 3, described at length and figured ; DOHERTY, J. A. S. B. lviii.

M. hartertii, Assam, DOHERTY, J. A. S. B. lviii, p. 128, pl. x, fig. 1, n. sp.

Sithon jalindra, Horsf., p. 106, *ravindra*, Horsf., var. ? *ravindrina*, p. 108, *thesmia*, Hew., p. 111, *onyx*, Moore, p. 112, *jaugala*, Horsf., *phocides*, Fab., varieties of described ; STAUDINGER, Deutsche e. Z. Lep. 1889.

S. tenuga, *kiana*, p. 317, *cineas*, p. 318, Kina Balu, SMITH, Ann. N. H. (6) iii ; *S. paluana*, p. 107, pl. i, fig. 9, *liris*, p. 110, fig. 10, *S. (?) peregrinus*, p. 111, fig. 11, *S. anytus*, p. 113, fig. 12, Palawan, STAUDINGER, Deutsche e. Z. Lep. 1889 : n. spp.

Yasoda, n. g., near *Loxura*, for *Y. tripunctata*, Hew. ; DOHERTY, J. A. S. B. lviii, p. 410.

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D. anabasis, p. 117, pl. i, fig. 13, *alcetas*, p. 119, Palawan, *distanti* = (*nila*, Dist., nec Koll.), Malacca, p. 121, STAUDINGER, Deutsche e. Z. Lep. 1889, n. spp.

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A. sophrosyne, Solomon Is., SMITH, Ent. M. M. xxv, p. 300 ; *A. pseudo-muta* = (*amphimuta*, Dist., nec Feld.), *athada* = (*adatha*, Dist., nec Hew.), Malacca, STAUDINGER, p. 125, t. c. ; *A. erebina*, p. 123, pl. i, fig. 14, *aricia*, p. 124, fig. 15, *allata*, p. 125, pl. ii, fig. 1, *myrtale*, p. 126, pl. i, fig. 16, *agesilaus*, p. 127, fig. 17, *epimete*, p. 128, pl. ii, fig. 2, *detrita*, p. 129, *palouana*, p. 131, fig. 3, *oberthuri*, p. 132, fig. 4, Palawan, STAUDINGER, Deutsche e. Z. Lep. 1889 : n. spp.

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A. venosa, S. Africa, TRIMEN, p. 339, S. Afr. Butt. iii, n. sp.

Achalarus, Scud., defined, pp. 1412-1415, and *A. lycidas* illustrated and described, pp. 1418-1427; SCUDDER, Butt. New England, ii.

Achlyodes amaurus, Mosauary, MABILLE, Le Nat. 1889, p. 216; *A. impressus*, Chiriqui, MABILLE, Le Nat. 1889, p. 67; *A. orsus*, Porto Cabello, *oiclus*, Chiriqui, MABILLE, Le Nat. 1889, p. 25; *A. ? anomala*, Mexico, MABILLE, Le Nat. 1889, p. 239 : n. spp.

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Amblyscirtes, Scud., defined, pp. 1575-1578, and *A. vialis* and *samoset* described and illustrated, pp. 1582-1592; SCUDDER, Butt. New England, ii.

Ancistrocampta amyrus, Colombia, DOGKIN, Le Nat. 1889, p. 14, n. sp.

Ancylozipha, Feld., defined, pp. 1551-1554, and *A. numitor* illustrated and described, pp. 1558-1563; SCUDDER, Butt. New England, ii. *A. numitor*, egg, described; BEUTENMÜLLER, Canad. Ent. xxi, p. 160.

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Anthomaster, Scud., defined, pp. 1667-1669, and *A. leonardus*, with metamorphoses illustrated and described, pp. 1673-1677; SCUDDER, Butt. New England, ii.

Antigonus unifascia, Central America, MABILLE, Le Nat. 1889. p. 239, n. sp.

Apauustus minimus, Australia, MISKIN, P. R. Soc. Queensl. vi, p. 153, n. sp.

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Astictopterus ulunda, Plötz, p. 147, *zanites*, Butl., p. 148, variation and synonymy noticed; STAUDINGER, Deutsche e. Z. Lep. 1889.

A. celunda, Celebes, STAUDINGER, p. 148, Deutsche e. Z. Lep. 1889, n. sp.

Atulopedes, Scud., defined, pp. 1656-1659, and *A. huron* described and illustrated, pp. 1661-1666; SCUDDER, Butt. New England, ii.

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Butleria quadristiga, p. xci, *riza*, *polydesma*, *doguini*, p. xcii, S. America. MABILLE, Bull. Soc. Ent. Fr. (6) ix, n. spp.

Calliana pieridoides, Moore, notes on ; DOHERTY, J. A. S. B. lviii, p. 133.

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Ceratrachia quaterna, Sierra Leone, MABILLE, p. clvi, Bull. Soc. Ent. Fr. (6) ix, n. sp.

Chapra mathias, F., var. figured, pl. B, fig. 7 ; J. Bomb. N. H. Soc. iv.

Choristoneura, n. g., for *C. apicalis*, n. sp., Sierra Leone ; MABILLE, p. clvi, Bull. Soc. Ent. Fr. (6) ix.

Cobalus subfacatus, p. clxviii, *duplex*, *corvinus*, *carbo*, p. clxix, Sierra Leone, MABILLE, Bull. Soc. Ent. Fr. (6) ix, n. spp.

Coladenia hamiltonii, Sylhet, NICÉVILLE, J. A. S. B. lvii, p. 291, pl. xiii, fig. 8, n. sp.

Dis, n. g., near *Pyrrhopyga*, for *D. annulatus*, n. sp., Chiriqui ; MABILLE, p. clxxxiv, Bull. Soc. Ent. Fr. (6) ix.

Eagris decolor, W. Africa, *melancholica*, Natal, MABILLE, p. clv, Bull. Soc. Ent. Fr. (6) ix, n. spp.

Enosis, n. g., near *Plesioneura*, p. ix, for *E. dognini*, Ecuador, *simplex*, p. ix, *atrata*, Colombia, *quadrinotata*, Chiriqui, p. x, n. spp. ; MABILLE, Bull. Soc. Ent. Fr. (6) ix.

Epargyreus, Hb., pp. 1393-1397, and *E. tityrus*, pp. 1399-1411, described, with metamorphoses, and illustrated ; SCUDDER, Butt. New England, ii.

Erionota (Caryapa) mabillei, Palawan, STAUDINGER, p. 135, pl. ii, fig. 5, Deutsche s. Z. Lep. 1889, n. sp.

Erycides perissographus, Chiriqui, MABILLE, Le Nat. 1889, p. 59, n. sp.

Erynnis, Schr., defined, pp. 1634-1639, *E. sassacus*, and other New England species described and illustrated, pp. 1641-1655 ; SCUDDER, Butt. New England, ii.

Eudamus, Sw., pp. 1378-1382, and *E. proteus*, pp. 1386-1392, with metamorphoses illustrated and defined ; SCUDDER, Butt. New England, ii.

Euphyes, Scud., defined, pp. 1735-1737, and *E. metacomet* and *verna* described and illustrated, pp. 1739-1745 ; SCUDDER, Butt. New England, ii.

Garga, n. g., near *Artsurotia*, for *G. olena*, n. sp., San Paulo ; MABILLE, Le Nat. 1889, p. 216.

Hemipteris, n. g., for *H. fumida*, n. sp., Itaítuba ; MABILLE, Le Nat. 1889, p. 216.

Gehlota, n. g. (but see *Celenorrhinus*, above), for *Plesioneura* *suavita* and allies; DOHERTY, p. 131, J. A. S. B. lviii.

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Husora anura, Sikkim, p. 170, pl. B, figs. 1 & 5, *hadria*, p. 172, Perak, NICÉVILLE, J. Bomb. N. H. Soc. iv, n. spp.

Hesperia, Fab., defined, pp. 1527-1531, and *H. montivaga* and *ce-tauræ*, described and illustrated, pp. 1536-1545; SCUDDER, Butt. New England, ii. *H. ahriman*, Chr., correction, p. 10; figure, pl. i, fig. 4; CHRISTOPH, in Rom. Mem. v. *H. keithloa*, Wallg., pl. xii, fig. 3, *pisistratus*, Fab., fig. 10, figured; TRIMEN, S. Afr. Butt. iii. *H. actæa*, food-plant; DIGBY, Ent. M. M. xxv, p. 283, and Ent. xxii, p. 138.

H. hellas, Punjab, NICÉVILLE, J. Bomb. N. H. Soc. iv, p. 177; *H. (?) cephaloides*, Burma, NICÉVILLE, J. A. S. B. lvii, p. 288, pl. xiii, fig. 4 : n. spp.

Hesperilla scepticalis, Rosk., ♂ described; MISKIN, P. R. Soc. Queensl. vi, p. 149.

H. atromacula, Victoria, p. 148, *tasmanicus*, Tasmania, p. 149, *humilis*, *croceus*, p. 150, *fulgidus*, p. 151, Brisbane, MISKIN, P. R. Soc. Queensl. vi, n. spp.

Heteropia, n. g., near *Eudamus*, for *H. imitatrix*, n. sp., Brazil, and *bryaxis*, Hew.; MABILLE, Le Nat. 1889, p. 68.

Heteropterus? (*Steropes*) *scopas*, p. 161, pl. ii, fig. 12, *catolencos*, p. 162, fig. 13, Palawan, STAUDINGER, Deutsche e. Z. Lep. 1889, n. spp.

Hidari bhawani, Burma, NICÉVILLE, J. A. S. B. lvii, p. 291, pl. xiii, fig. 6, n. sp.

Hyda, n. g., near *Pythonides*, p. clxxxiii, for *H. micacea*, n. sp., Monrovia, p. clxxxiv; MABILLE, Bull. Soc. Ent. Fr. (6) ix.

Hylephila, Bil., defined, pp. 1625-1627, *H. phylæus*, pp. 1630-1634, described and illustrated; SCUDDER, Butt. New England, ii.

Ismene sena, n. var. *palawana*; STAUDINGER, p. 139, Deutsche e. Z. Lep. 1889. *I. anchises*, *forestan*, larvæ described; MATHEW, Ent. M. M. xxv, p. 428.

I. proximata, Palawan, STAUDINGER, p. 137, Deutsche e. Z. Lep. 1889, n. sp.

Lerema, Scud., defined, pp. 1763-1766, *L. accius*, *hiana*, illustrated and described, pp. 1768-1774; SCUDDER, Butt. New England, ii.

Limochores, Scud., defined, pp. 1711-1715, and the four New England species described and illustrated, pp. 1717-1735; SCUDDER, Butt. New England, ii.

Notocrypta, n. g., for part of *Plesioneura*; NICÉVILLE, J. Bomb. N. H. Soc. iv, p. 188.

Oligoria, Scud., defined, pp. 1757-1759; *O. maculata* described, p. 1761; SCUDDER, Butt. New England, ii.

Pamphila defined, pp. 1563-1567, and *P. mandun*, pp. 1569-1575, described and illustrated; SCUDDER, Butt. New England, ii.

P. philippina, pp. 142 & 164, *homolea*, *angiades*, p. 144, *maesoides* (= *luzonensis*, Mab.), pp. 145 & 164, *goloides*, Moore, *verruca*, Mab., p. 146, varietal notes on; STAUDINGER, Deutsche e. Z. Lep. 1889. *P. hottentota*, pl. xi, figs. 8 & 8a, *zeno*, Trimen., pl. xii, fig. 2, *morantii*, Trimen., fig. 3,

moritili, Wallg., fig. 4, figured; *morantii*, = (*ranoha*, Westw.), p. 312; TRIMEN, S. Afr. Butt. iii.

P. rhabdophorus, *adon*, *adosus*, p. cxlix, *rega*, p. cl, Sierra Leone, MABILLE, Bull. Soc. Ent. Fr. (6) ix; *P. monasi*, p. 317, *ayresii*, p. 321, pl. xii, fig. 1, S. Africa, TRIMEN, S. Afr. Butt. iii; *P. noctis*, Palawan, STAUDINGER, p. 143, Deutsche e. Z. Lep. 1889; *P. autoleon*, *fuliginosa*, p. 147, *albifascia*, p. 148, Queensland, MISKIN, P. R. Soc. Queensl. vi; *P. verruca*, Nias, p. lxxxiv, *hercules*, Celebes, *fulgens*, Venezuela, p. lxxxv, MABILLE, Bull. Soc. Ent. Fr. (6) ix; *P. niceolimbus*, Guatemala, p. 133, *epiberus*, Chiriqui, p. 134, MABILLE, Le Nat. 1889; *P. citrus*, Honduras, p. 144, *berus*, Chiriqui, p. 145, MABILLE, Le Nat. 1889; *P. sagitta*, *sethos*, p. 173, *bipunctata*, p. 174, Chiriqui, MABILLE, Le Nat. 1889: n. spp.

Parnara uma, Burma, NICÉVILLE, J. A. S. B. lvii, p. 292, pl. xiii, fig. 9; *P. pholus*, p. 172, pl. ii, fig. 3, *sarala*, p. 173 & fig. 6, *parca*, p. 174 & fig. 10, E. India, NICÉVILLE, J. Bomb. N. H. Soc. iv: n. spp.

Pellicia bilinea, Chiriqui, MABILLE, Le Nat. 1889, p. 216, n. sp.

Pholisora, Scud., defined, pp. 1514-1518, and *P. catullus*, pp. 1519-1527, described and illustrated; SCUDDER, Butt. New England, ii.

Phycanassa, Scud., defined, p. 1600, *P. viator* described, p. 1604, figured pl. xvii, figs. 20, &c; SCUDDER, Butt. New England, ii.

Pirdana hyela, Hew., genus and species, note on; STAUDINGER, p. 140, Deutsche e. Z. Lep. 1889.

P. distanti, Malacca, STAUDINGER, p. 141, Deutsche e. Z. Lep. 1889, n. sp.

Plastingia tessellata, p. 149, *callineura*, p. 150, varr. described; STAUDINGER, Deutsche e. Z. Lep. 1889.

P. margherita, Assam, DOHERTY, J. A. S. B. lviii, p. 131, pl. x, fig. 5; *P. submaculata*, Palawan, STAUDINGER, p. 149, pl. ii, fig. 8, Deutsche e. Z. Lep. 1889: n. spp.

Plesioneura alysos, Moore, *signata*, Druce, synonymy and variation discussed, pp. 151-153, *atilia*, Mab., n. var. *palawana*, pp. 157 & 165, pl. ii, fig. 11, *adrastus*, Cr., (= *praba*, Moore, *phanicis*, Hew.), p. 158, variation and synonymy; STAUDINGER, Deutsche e. Z. Lep. 1889. *P. zawi*, Plötz, = (*Plastingia plesioneura*, Stgr.); STAUDINGER, p. 154, Deutsche e. Z. Lep. 1889.

P. fusca, S. India, HAMPSON, J. A. S. B. lvii, p. 367; *P. luxmi*, Tenasserim, pl. xiii, fig. 5, *basiflava*, Travancore, fig. 7, NICÉVILLE, p. 290, J. A. S. B. lvii; *P. clavata*, p. 153, pl. ii, fig. 9, *aliena*, p. 155, *palajava*, p. 156, fig. 10, Palawan, STAUDINGER, Deutsche e. Z. Lep. 1889; *P. jao*, Pebas, DOGNIN, Le Nat. 1889, p. 14: n. spp.

Poanes, Scud., defined, pp. 1592-1594, *P. massasoit* described, p. 1597, figured pl. x, fig. 6, &c.; SCUDDER, Butt. New England, ii.

Polites, Scud., defined, pp. 1678-1680, and *P. peckius*, with metamorphoses illustrated and described; SCUDDER, Butt. New England, ii.

Proteides excellens, Palawan, STAUDINGER, p. 141, pl. ii, fig. 6, Deutsche e. Z. Lep. 1889; *P. myna*, *modius*, *viridiceps*, Chiriqui, MABILLE, Le Nat. 1889, p. 99; *P. chiriquensis*, *martius*, Chiriqui, MABILLE, Le Nat. 1889, p. 127; *P. chiriquensis*, Chiriqui, MABILLE, Le Nat. 1889, p. 239: n. spp.

Pterygosyidea, Wallgr., = (*Nisionades*, Hb.), p. 352, *P. djakala*, pl. xii, fig. 7, *phyllophila*, pl. xii, fig. 8, figured; TRIMEN, S. Afr. Butt. iii. *P. moori*, Mab, figured, pl. v, figs. 9a, b; Rom. Mem. v.

Pyrgus agylla, transvaalia, p. 286, *nanus*, p. 290, S. Africa, TRIMEN, S. Afr. Butt. iii, n. spp.

Pythonides zonula, no locality, MABILLE, Le Nat. 1889, p. 67; *P. narycus*, S. America, MABILLE, Le Nat. 1889, p. 239: n. spp.

Rhabdoides, n. g., for *Eudamus cellus*, Bois.; SCUDDER, p. 1854, Butt. New England, iii.

Sapcea, Plötz, merged in *Abantis*; TRIMEN, p. 336, S. Afr. Butt. iii.

Steropes furvus, Sierra Leone, MABILLE, Bull. Soc. Ent. Fr. (6) ix, p. clvi, n. sp.

Stethotrix, n. g., near *Caprona*, for *S. heterogyna*, n. sp., Natal; MABILLE, p. clxxxiv, Bull. Soc. Ent. Fr. (6) ix.

Suastus gremius, Fab., its injuries to rice, metamorphosis; NICKVILLE, Ind. Mus. Notes i, pp. 9-11, pl. i, fig. 4.

Syrichthus alveus, Hb., and *malva*, L., varr. described; FUCHS, J.B. nam. Ver. xlii, pp. 195-204. *S. sao*, early stages of; CHRÉTIEN, Le Nat. 1889, p. 35.

Tagiades gamelia, Cape York, MISKIN, P. R. Soc. Queensl. vi, p. 146, n. sp.

Telegonus advena, Chiriqui, MABILLE, Le Nat. 1889, p. 59, n. sp.

Thanaos defined, pp. 1445-1454, and the New England species monographed, pp. 1457-1514, with illustrations; SCUDDER, Butt. New England, ii.

Thorybes, Scud., defined, pp. 1423-1427, and *T. bathyllus* and *pylades*, pp. 1432-1445, illustrated with metamorphoses and described; SCUDDER, Butt. New England ii.

Thymelicus, Hb., defined, pp. 1689-1692, and *T. aetna, brettus*, and *mystic*, described and illustrated, pp. 1695-1711; SCUDDER, Butt. New England, ii. *T. lepenula*, pl. xi, fig. 6, *wallengrenii*, fig. 7, figured; TRIMEN, S. Afr. Butt. iii.

T. bicolor, Honduras, MABILLE, Le Nat. 1889, p. 174, n. sp.

Trapezites idothea, p. 152, *phillyra*, p. 153, Victoria, MISKIN, P. R. Soc. Queensl. vi, n. spp.

HETEROCERA.

Catalogue of the moths of India (conclusion); COTES & SWINHOE (167).

SPHINGIDÆ.

[Cf. BUTLER (113, 115), DRUCE (202), ELLIS (221), FYLES (296), HOLLAND (390, 391, 406), MEYRICK (567).]

Remarks on the horn in Javanese and other species; PIEPERS, Tijdschr. Ent. xxxii, pp. cxxiii-cxxv.

Sphingide of Québec and their larvæ: FYLES (296).

Cephonodes woodfordii, Solomon Is., BUTLER, Tr. E. Soc. 1889, p. 389, pl. xii, fig. 1, n. sp.

Aellopus commasiae, Wlk., figured, pl. ii, fig. 1; HOLLAND, Tr. Am. Ent. Soc. xvi.

Pseudenyo, n. g. *Macroglossinæ*, for *P. benitensis*, n. sp., Africa, pl. ii, fig. 2; HOLLAND, p. 57, Tr. Am. Ent. Soc. xvi.

Eulophura, n. g., p. 58, for *E. atrofasciata*, n. sp., W. Africa, p. 59, pl. ii, fig. 3, and *Lophura sardanus*, Boisd.; HOLLAND, Tr. Am. Ent. Soc. xvi.

Ocyton scitula, pl. ii, fig. 4, *lapygoides*, fig. 5, p. 60, *reutingeri*, fig. 6, *eranga*, fig. 7, p. 61, W. Africa, HOLLAND, Tr. Am. Ent. Soc. xvi, n. spp.

Protoparce calapagensis, Charles L., HOLLAND, P. U. S. Nat. Mus. xii, p. 195, n. sp.

Ambulyx placida, Moore, figured; BUTLER, pl. cxxi, fig. i, Ill. Lep. Het. vii.

A. rubescens, N. India, BUTLER, Ill. Lep. Het. vii, p. 26, pl. cxxi, fig. 2; *A. donysa*, Mexico, DRUCE, p. 78, Ann. N. H. (2) iv : n. spp.

Charocampa elpenor, L., = (*lewisii*, Butl.); LEECH, p. 120, Tr. E. Soc. 1889.

C. livida, W. Africa, HOLLAND, p. 63, pl. iii, fig. 4, Tr. Am. Ent. Soc. xvi; *C. ortospana*, Mexico, *suana*, Bahamas, DRUCE, p. 77, Ann. N. H. (6) iv : n. spp.

Acosmeryx iyenobu, Japan, HOLLAND, Tr. Am. Ent. Soc. xvi, p. 71, n. sp.

Pergesa irregularis, Walk., figured, pl. iii, fig. 3, and referred to *Charocampa*, p. 63; HOLLAND, Tr. Am. Ent. Soc. xvi.

Deilephila euphorbia, var. figured; RIBBE, Deutsche e. Z. Lep. p. 186, pl. iv, fig. 4. *D. nicæa*, description of var.; AUSTAUT, Le Nat. 1889, p. 232. *D. insidiosa*, Erschoff, note on; KIRBY, Ent. M. M. xxv, p. 361. *D. galii*, as a British insect; TUGWELL, Ent. M. M. xxv, p. 284. On the recent abundance of *D. galii*; ELLIS (221).

D. heliodes, N. Guinea, MEYRICK, Tr. E. Soc. 1889, p. 455, n. sp.

Ampelophaga fasciosa, Moore, figured; BUTLER, Ill. Lep. Het. vii, pl. cxxi, fig. 3.

Macrosila tetrío, L., food-plant of larva; CARACCILO, Bull. Soc. Ent. Fr. (6) ix, p. clxxviii.

Sphinx luscitiosa, Cl., larva described; DYAR, Ent. Amer. v, p. 189. *S. ligustri*, food-plant; MITCHELL, Ent. xxii, p. 73. *S. gordius*, colour variation in larva; SOULE, Psyche, v, p. 228. *S. concoleuli*, hermaphrodite; ECKSTEIN, Ber. Oberhess. Ges. xxvi, p. 53, pl. ii, fig. 3.

Antinephele, n. g., p. 68, for *A. maculifera*, pl. iii, fig. 2, p. 69, *muscosa*, p. 70, pl. ii, fig. 8, n. spp., W. Africa, and *Nephele anomala*, Butl.; HOLLAND, Tr. Am. Ent. Soc. xvi.

Dolba hylæus, metamorphoses, SOULE & ELIOT, Psyche, v, p. 267.

Acherontia atropos, noise emitted from pupa; DENFER, Bull. Soc. Ent. Fr. (6) ix, p. cc. *A. atropos*, *styx*, *medusa*, varietal note; LEECH, Tr. E. Soc. 1889, p. 118.

Smerinthus populi, var. described; FUCHS, JB. nass. Ver xlii, p. 204. *S. exæcatus*, maculation of larva, pupation; HINKLEY, Psyche, v, p. 152. *S. ocellatus* and *populi*, hybrid; ECKSTEIN, Ber. Oberhess. Ges. xxvi, p. 54, pl. ii, fig. 4. *S. tilieæ*, L., embryology; GRABER (329).

Cressonia juglandis, metamorphoses; SOULE & ELIOT, *Psyche* v, p. 264.
Paonias astylus, Dr., *myops*, A. & S., metamorphoses; SOULE & ELIOT, *Psyche*, v, pp. 265 & 266.

Basiana hornimanni, figured, pl. iii, figs. 5 & 6, noticed, p. 66; HOLLAND, Tr. Am. Ent. Soc. xvi.

B. enodia, W. Africa, HOLLAND, p. 66, pl. iv, fig. 3, Tr. Am. Ent. Soc. xvi, n. sp.

Polyptychus trilineatus, Moore, figured; BUTLER, pl. cxxi, fig. 4, Ill. Lep. Het. vii.

P. goodii, W. Africa, HOLLAND, p. 64, pl. iv, fig. 2, Tr. Am. Ent. Soc. xvi, n. sp.

Devizia, n. g., for *D. pauperula*, n. sp., W. Africa, pl. iv, fig. 1, and *Smerinthus pechuelii*, Dew.; HOLLAND, p. 65, Tr. Am. Ent. Soc. xvi.

ÆGERIIDÆ AND THYRIDIDÆ.

[Cf. BRANDT (96), BUTLER (113), DRUCE (202), FRENCH (289), FUCHS (293), LEECH (484), STAUDINGER (844).]

Sciapteron tabaniforme, habits of larva; SCHMID, Soc. Ent. iii, p. 186.

S. chinense, Kiukiang, LEECH, p. 121, pl. vii, fig. 5, Tr. E. Soc. 1889, n. sp.

Sesia myopæformis, habits of larva; SCHMID, Soc. Ent. iii, p. 186. *S. apheciiformis*, *culiciformis*, &c., larvæ noticed; *id. op. cit.* iv, pp. 3, 4, &c. *S. ichneumoniformis*, *affinis*, *chrysidiformis*, habits in Rhineland; FUCHS (293).

S. duplex, p. 21, *vidua*, p. 22, Central Asia, STAUDINGER, S. E. Z. I, n. spp.

Trochilium apiforme, habits of larva; SCHMID, Soc. Ent. iii, p. 185. *T. apiforme* and *Sesia tipuliformis*, anatomy of; BRANDT (96).

Egeria pinorum (Behr. MS.), Monterey, FRENCH, p. 163, Canad. Ent. xxi; *E. hader*, p. 78, *halmyris*, *hela*, *hermione*, p. 79, *hipsides*, *hippolyte*, *helena*, *pullene*, p. 80, Mexico, DRUCE, Ann. N. H. (6) iv: n. spp.

Tarsopoda marcia, Mexico, DRUCE, p. 81, Ann. N. H. (6) iv, n. sp.

Melittia kulluana, Moore, figured, pl. cxxxv, fig. 12; BUTLER, Ill. Lep. Het. vii.

M. smithi, Mexico, DRUCE, p. 81, Ann. N. H. (6) iv, n. sp.

Sincara mæonia, p. 81, *manilia*, *manoba*, p. 82, Mexico, DRUCE, Ann. N. H. (6) iv, n. spp.

Acridura, position noticed; WALSINGHAM, Tr. Ent. Soc. 1889, p. 4.

Hyperpythrus, n. g., near *Thyris*, p. 121, for *H. aperta*, n. sp., Kiukiang, p. 122, pl. vii, fig. 7; LEECH, Tr. E. Soc. 1889.

Phostria, Hb., composition and position; cf. *Pyalidæ*.

URANIIDÆ, AGARISTIDÆ, CHALCOSIIDÆ, HIMANTOPTERIDÆ, CTENUCHIDÆ, EUSCHEMIDÆ.

[Cf. BUTLER (113, 118), DRUCE (202), LEECH (484), MEYRICK (567), RIBBE (706), SCHATZ (763, 764), SWINHOE (852).]

Urania ripheus, notes on larva; CAMBOUÉ (124), and Rev. Sci. Nat.

App. xxxvi, p. 439 : larva noticed ; MABILLE, Bull. Soc. Ent. Fr. (6) ix, p. xlv.

Agarista eurychrysa, *neurogramma*, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 468, n. spp.

Eusemia accurata, Moulmein, SWINHÖE, P. Z. S. 1889, p. 401 ; *E. rüberi*, Banggaja, RIBBE, p. 184, pl. iii, fig. 3, Deutsche e. Z. Lep. 1889 : n. spp.

Alypia octomaculata, noise made by : EDWARDS, Ina. Life, ii, p. 14.

Pseudalypia stuartii, Mexico, SCHAU, Ent. Am. v, p. 87, n. sp.

Leisoma juanita, Mexico, SCHAU, Ent. Am. v, p. 87, n. sp.

Epicopeia hainesii, Japan, HOLLAND, Tr. Am. Ent. Soc. xvi, p. 72, n. sp.

Pompelon valentula, Burmah, SWINHÖE, P. Z. S. 1889, p. 401, n. sp.

Gynautocera fraterna, Calcutta, BUTLER, p. 27, pl. cxxi, fig. 7, Ill. Lep. Het. vii, n. sp.

Boradia carneola, Kangra, BUTLER, p. 27, pl. cxxi, fig. 8, Ill. Lep. Het. vii, n. sp.

Anomæotes, Feld., = (*Akesina*, Moore) ; BUTLER, p. 28, Ill. Lep. Het. vii. *A. basalis*, Moore, figured, t. c. pl. cxxi, fig. 9.

Gingla æqualis, Mexico, DRUCE, p. 82, Ann. N. H. (6) iv, n. sp.

Erasmia hobsoni, Formosa, BUTLER, Ann. N. H. (6) iv, p. 53, n. sp.

Arachotia hyalina, Kiukiang, LEECH, p. 123, pl. vii, fig. 6, Tr. E. Soc. 1889, n. sp.

Pedoptila staudingeri, noticed, p. 554, figured, pl. xxiii, fig. 9 ; ROGENHOFER, Ann. Hofmuseum Wien, iv.

Milionia, cf. *Lithosiidæ*.

Fossil moth of the family *Euschemidæ*, see BUTLER (117) and Palæo-entomology, p. 81.

Idalus, cf. *Arctiidæ*.

Theages, cf. *Arctiidæ*.

ZYGÆNIDÆ.

[Cf. CHRIST (145), CHRISTOPH (146, 748), DOGNIN (193), DRUCE (202), LEECH (484), MEYRICK (567), SCHAU (763), STAUDINGER (844), SWINHÖE (852), WESTWOOD (608).]

Zygena tamara, Chr., described at length and figured, p. 196, pl. ix, figs. 2, a & b ; CHRISTOPH, Rom. Mem. v. *Z. filipendulæ*, local variation ; MEYRICK, Ent. M. M. xxv, p. 184. *Z. erschoffi*, n. var. *rhodogastra* ; STAUDINGER, S. E. Z. I, p. 24. *Z. pilosellæ*, n. var. *grossmanni* ; RÜHL, Soc. Ent. iii, p. 188. *Z. filipendulæ*, varr. noticed ; OBERTHUR, Bull. Soc. Ent. Fr. (6) ix, p. lxxvi : monstrosity and yellow var. ; RICHARDSON (709). *Z. trifolii* and *filipendulæ*, interbreeding of ; BAKER, Ent. M. M. xxv, p. 212.

Z. algarbiensis, Portugal, CHRIST, MT. schw. ent. Ges. viii, p. 101 ; *Z. magiana*, Samarcand ; STAUDINGER, S. E. Z. I, p. 23 ; *Z. tamara*, Ordubad, CHRISTOPH, Hor. Ent. Ross. xxiii, p. 300 ; *Z. transversalis*, Matabele Land, WESTWOOD, in Oates' Matabele Land, ed. ii, p. 364 : n. spp.

Hecatesia fenestrata and *thyridion*, sound produced by ; EDWARDS, *Imm. Life*, ii, p. 15.

Ino paupera, ACHAL TEKKE, CHRISTOPH, *Rom. Mem.* v, p. 12, n. sp.

Syntomis vimberleyi, ANDAMAN IS., SWINHÖE, *P. Z. S.* 1889, p. 400, pl. xliii, fig. 11, n. sp.

S. pratti, p. 123, fig. 3, *pascus*, fig. 1, *torquatus*, fig. 2, p. 124, Kiu-kiang, LEECH, *Tr. E. Soc.* 1889, n. spp.

Notioptera properta, Rangoon, SWINHÖE, *P. Z. S.* 1889, p. 400, pl. xliii, fig. 6, n. sp.

Euchromia cyanitis, N. Guinea, MEYRICK, *Tr. E. Soc.* 1889, p. 457, n. sp.

Eucereon nebulosum, Loja, DOGNIN, *Le Nat.* 1889, p. 58, n. sp.

Nacila punctata, var. *parviguttata* ; CHRISTOPH, *Rom. Mem.* v, p. 13, pl. i, fig. 5.

Harrisina mexicana, Paso de San Juan, SCHAUS, *Ent. Am.* v, p. 87, n. sp.

Lycomorpha teos, regia, Mexico, SCHAUS, *Ent. Am.* v, p. 88, n. spp.

Macrocneme cinnyras, Mexico, SCHAUS, *Ent. Am.* v, p. 88, n. sp.

Callicarus laciades, mistra, p. 88, *jalapensis*, p. 89, Mexico, SCHAUS, *Ent. Am.* v, n. spp.

Cosmosoma ethodæa, Mexico, DRUCE, p. 84, *Ann. N. H.* (6) iv ; *C. aleas*, Mexico, SCHAUS, *Ent. Am.* v, p. 89 : n. spp.

Dycladia lydia, p. 84, *thera, utica*, p. 85, Mexico, DRUCE, *Ann. N. H.* (6) iv ; *D. pyrrha*, Mexico, SCHAUS, *Ent. Am.* v, p. 89 : n. spp.

Syntomedia vulcana, Mexico, DRUCE, p. 83, *Ann. N. H.* (6) iv, n. sp.

Ichoria (?) *parthia*, Nicaragua, DRUCE, p. 83, *Ann. N. H.* (6) iv, n. sp.

Leomochuris masa, Mexico, DRUCE, p. 84, *Ann. N. H.* (6) iv, n. sp.

Gymnopoda mecrida, Mexico, DRUCE, p. 84, *Ann. N. H.* (6) iv, n. sp.

ARCTIIDÆ.

[*Cf.* BUTLER (113), DOGNIN (193), DRUCE (202), FRENCH (285, 286, 288), HUDSON (410), MEYRICK (567), PORRITT (645), SCHAUS (763, 764), SLOSSON (822, 823), SMITH (828), SWINHÖE (852).]

[N.B.—Arrangement alphabetical.]

Arctiide of N. America, catalogue, with notes on generic and specific characters ; SMITH (828).

Aclytia lucania, superba, Mexico, SCHAUS, p. 89, *Ent. Am.* v, n. spp.

Alou sara, insolata, pl. xliii, fig. 15, E. India, SWINHÖE, *P. Z. S.* 1889, p. 404, n. spp.

Alpenus multiguttatus, larva described, p. 120, figured, pl. cxxxviii, fig. 9 ; BUTLER, *Ill. Lep. Het.* vii.

Amulodeta, n. g., p. 462, for *A. electraula*, n. sp., New Guinea, p. 463 ; MEYRICK, *Tr. E. Soc.* 1889.

Andala unifascia, larva described, p. 120, pl. cxxxviii, fig. 11 ; BUTLER, *Ill. Lep. Het.* vii.

Arachnis perolensis, suffusa, Mexico, SCHAUS, *Ent. Am.* v, p. 190, n. spp.

Arctia caja, fig. 3, *villica*, fig. 4, larvæ figured, pl. xlv; BUCKLER, Larvæ Brit. iii. *A. genura*, Str., descriptive note; FRENCH, Canad. Ent. xxi, p. 162. *A. lubricipeda*, var. *radiata*, note on; PORRITT, Naturalist, 1889, p. 233. *A. maculosa*, var. *reticulata*; CHRISTOPH, Rom. Mem. v, p. 13. *A. mendica*, varr. noticed, p. 441; figured, pl. xiv; PORRITT, Tr. E. Soc. 1889. *A. erschoffi*, Alph., n. var., *issyka*, STAUDINGER, S. E. Z. 1, p. 25.

Arctia shastaensis, n. var. or n. sp., N. America, FRENCH, Canad. Ent. xxi, p. 35: note on, with figure, FRENCH, t. c. p. 162; *A. (Metacrius) strategica*, New Zealand, HUDSON, Ent. xxii, p. 53, woodcut: n. spp.

Automolis nabdalsa, *orbona*, *parma*, Mexico, SCHAUS, p. 90, Ent. Am. v, n. spp.

Calligenia phryctopa, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 462, n. sp.

Callimorpha, notes on the N. American species; LYMAN, Canad. Ent. xxi, pp. 231-236. *C. jacobææ*, larva figured, pl. xlvi, fig. 1; BUCKLER, Larvæ Brit. iii.

Carules dicina, Mexico, SCHAUS, Ent. Am. v, p. 191, n. sp.

Cerathosia: note on systematic position; SMITH, Ent. Am. v, p. 8, and GROTE, p. 37, Canad. Ent. xxi. *C. tricolor*, eggs and young larvæ; HULST, Ent. Am. v, p. 118.

Chelonia villica and *caja*, varr. noticed; OBERTHUR, Bull. Soc. Ent. Fr. (6) ix, p. lxxxiii.

Chlorogenia, n. g., for *C. choleroia*, n. sp., New Guinea; MEYRICK, Tr. E. Soc. 1889, p. 461.

Deiopeia pulchella, larva figured, pl. xlvi, fig. 3, metamorphoses noticed, pp. 52-56; BUCKLER, Larvæ Brit. iii.

Diaphora mendica, larva figured, pl. xlv, fig. 5; BUCKLER, Larvæ Brit. iii.

Diptera fuscata, Moore, figured; BUTLER, pl. cxxii, fig. 1, Ill. Lep. Het. vii.

Ecpantheria amulaensis, Mexico, DRUCE, p. 87, Ann. N. H. (6) iv; *E. robusta*, p. 193, *gaujoni*, p. 210, Loja, DOGNIN, Le Nat. 1889: n. spp.

Epizeuctis, n. g., for *Nola inocua*, Bntl.; MEYRICK, Tr. E. Soc. 1889, p. 463.

Euchetes egle, habits of larva; MOFFAT, Rep. E. Soc. Ont. xix, p. 20.

Eulepia cribrum, larva figured, pl. xlvi, fig. 2; BUCKLER, Larvæ Brit. iii.

Euphanessa meridiana, Florida, SLOSSON, Ent. Am. v, p. 7; *E. pauper*, Mexico, SCHAUS, Ent. Am. v, p. 192: n. spp.

Euthemonia russula, larva figured, pl. xlv, fig. 2; BUCKLER, Larvæ Brit. iii.

Evius walkeri, Panama, DRUCE, p. 86, Ann. N. H. (6) iv, n. sp.

Galethalea davidi, Ecuador, DOGNIN, Le Nat. 1889, p. 14, n. sp.

Gnophala vermiculata, foodplant and egg; COCKERELL, Canad. Ent. xxi, p. 220: larva described; COCKERELL, Ent. Am. v, p. 57.

Halesidota phellia, Brazil, p. 86, *H. (?) syrucosia*, Mexico, p. 87, DRUCE, Ann. N. H. (6) iv, n. spp.

Hectogama, n. g., for *H. dissozona*, n. sp., New Guinea; MEYRICK, Tr. E. Soc. 1889, p. 465

Helvira alia, Mexico, SCHAUS, Ent. Am. v, p. 90, n. sp.

Hypercompa dominula, larva figured, pl. xlv, fig. 1; BUCKLER, Larvæ Brit. iii. *H. principalis*, larva described, p. 122, figured pl. cxxxviii, fig. 3, BUTLER, Ill. Lep. Het. vii; *H. principalis*, Koll., n. var. *regalis*; LEECH, p. 125, pl. ix, fig. 4, Tr. E. Soc. 1889.

Icambosida dorsalis, Moore, referred to *Thyrgorina*, p. 29, and figured pl. cxxii, figs. 4 & 5, larva described, p. 121, figured pl. cxxxviii, fig. 4; BUTLER, Ill. Lep. Het. vii.

Idalus herois, Mexico, SCHAUS, Ent. Am. v, p. 190; *I. ? citrarius*, Loja, DOGNIN, Le Nat. 1889, p. 173: n. spp.

Lachanz, *Phaos*, and *Metacrius*, note on characters of; BUTLER, p. 29, Ill. Lep. Het. vii; *L. ladakensis*, Moore, figured, pl. cxxi, fig. 6, Ill. Lep. Het. vii.

Leptarctia, all the supposed species are varr. of one; n. varr. described and figured; FRENCH (286). *L. californicæ*, varr. described and figured, and some named; FRENCH, Ann. Soc. Ent. Fr. (6) ix, pp. 493-498, pl. ix.

Licnoptera, n. g., p. 460, for *L. crocodora*, n. sp., New Guinea, p. 461; MEYRICK, Tr. E. Soc. 1889.

Macaduma tortricella, Wlk., redescribed; MEYRICK, Tr. E. Soc. 1889, p. 460.

Melanareas, n. g., for *Euprepia imperialis*, Koll.; BUTLER, p. 29, Ill. Lep. Het. vii.

Nemeophila plantaginis, early stages; BRUCE, Ent. Am. v, p. 112: larva figured, pl. xlv, fig. 5; BUCKLER, Larvæ Brit. iii. *N. rusaola* var. noticed; ZIEGLER, B. E. Z. xxxiii, p. 1, S.B.

Opharus triatis, Mexico, SCHAUS, Ent. Am. v, p. 191; *O. carbonarius*, Loja, DOGNIN, Le Nat. 1889, p. 284: n. spp.

Pangora rubelliana, E. India, SWINHOE, P. Z. S. 1889, p. 403, n. sp.

Petalopleura, n. g., p. 458, for *P. phaecephala*, n. sp., New Guinea, p. 459; MEYRICK, Tr. E. Soc. 1889.

Phæoptera hyalina, Mexico, DRUCE, p. 87, Ann. N. H. (6) iv; *P. hyalina*, Ecuador, DOGNIN, Le Nat. 1889: n. spp.

Phragmatobia fuliginosa, larva figured, pl. xlv, fig. 1; BUCKLER, Larvæ Brit. iii.

P. rubricosta, Loja, DOGNIN, Le Nat. 1889, p. 193, n. sp.

Rajendra pumosa, larva described, p. 121, figured, pl. cxxxviii, fig. 8; BUTLER, Ill. Lep. Het. vii.

Sarotricha demiota, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 464, n. sp.

Seirarctia echo, larva described; SLOSSON & EDWARDS, Ent. Am. v, pp. 153-155. *S. quadriramosa*, larva described, p. 121, figured, pl. cxxxviii, fig. 1; BUTLER, Ill. Lep. Het. vii.

Sorocostia tetraphthalma, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 463, n. sp.

Spilarctia dalbergæ, figured, pl. cxxii, fig. 2; BUTLER, Ill. Lep. Het. vii. *S. lacteata*, larva described, p. 121, figured, pl. cxxxviii, fig. 2; BUTLER, Ill. Lep. Het. vii.

S. howqua, Kangra, BUTLER, p. 28, pl. cxxii, fig. 3, Ill. Lep. Het. vii;

S. ummera, Burmah, SWINHOE, P. Z. S. 1889, p. 405, pl. xliii, fig. 1 : n. spp.

Spilosoma congrua, Wlk., synonymy of ; SMITH, Ent. Am. v, p. 119 : larva described ; SOULE & ELIOT, Psyche, v, p. 263. *S. fuliginosa* var. *pulcerulenta* described ; ALPHÉRAKY, Rom. Mem. v, p. 84. *S. menthastris*, fig. 2, *papyratia*, fig. 3, *lubricipeda*, fig. 4, larvæ figured, pl. xlv, metamorphoses of latter noticed, p. 50 ; BUCKLER, Larvæ Brit. iii.

S. prima, N. America, SLOSSON, Ent. Am. v, p. 40, n. sp.

Teratopora, n. g., for *T. haplodes*, n. sp., New Guinea ; MEYRICK, Tr. E. Soc. 1889, p. 459.

Theages striata, Mexico, DRUCE, p. 86, Ann. N. H. (6) iv ; *T. lineata*, Loja, DOGNIN, Le Nat. 1889, p. 173 : n. spp.

Tigrioides nephelozona, N. Guinea, MEYRICK, Tr. E. Soc. 1889, p. 458, n. sp.

Tinolius hypsana, Sikkim, SWINHOE, P. Z. S. 1889, p. 405, n. sp.

Tylanthæa, n. g., p. 459, for *T. ptochius*, n. sp., New Guinea, p. 460 ; MEYRICK, Tr. E. Soc. 1889.

Zutrephe philobia, Mexico, DRUCE, p. 88, Ann. N. H. (6) iv, n. sp.

LITHOSIIDÆ.

[Cf. BUTLER (113, 115), DRUCE (202), FRENCH (289), LEECH (484), SCHAUS (764), SWINHOE (852).]

[N.B.—Arrangement alphabetical.]

Emene inconstans, fig. 11, *sagittifera*, fig. 12, figured, pl. cxxii ; BUTLER, Ill. Lep. Het. vii.

Ameria tezana, Texas, FRENCH, Canad. Ent. xxi, p. 161, n. sp.

Bizone phædra, Kiukiang, LEECH, p. 126, pl. ix, fig. 6, Tr. E. Soc. 1889, n. sp.

Brycea esula, p. 88, *arbela*, *semirosea*, *feronia*, Mexico, p. 89, DRUCE, Ann. N. H. (6) iv, n. spp.

Callinola, n. g., p. 33, for *Ræselia scripta*, Moore, which is figured, pl. cxxii, fig. 13 ; BUTLER, Ill. Lep. Het. vii.

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Cossa ruma, E. India, SWINHOE, P. Z. S. 1889, p. 403, n. sp.

Crambomorpha tolteca, Mexico, SCHAUS, Ent. Am. v, p. 191, n. sp.

Cybosia mesomella, larva figured, pl. xlii, fig. 3 ; noticed, p. 34 ; BUCKLER, Larvæ Brit. iii.

Digama abietis, Kiukiang, LEECH, p. 126, pl. ix, fig. 5, Tr. E. Soc. 1889, n. sp.

Ecotrocha securizonis, Solomon Is., BUTLER, Tr. E. Soc. 1889, p. 389, pl. xii, fig. 2, n. sp.

Gnophria rubricollis, larva figured, pl. xlii, fig. 2 ; noticed, p. 34 ; BUCKLER, Larvæ Brit. iii.

Lebena (sub *Ræselia*) *angulata*, Moore, = (*fraterna*, Moore), p. 34, figured, pl. cxxii, fig. 14 ; BUTLER, Ill. Lep. Het. vii.

Leptidule æetes, Mexico, SCHAUS, Ent. Am. v, p. 191, n. sp.

Lithosia: the larvæ of the British species figured, pls. xl & xli; noticed, pp. 14-26; BUCKLER, Larvæ Brit. iii. *L. lutarella*, Alpine, var. noticed; ZIEGLER, B. E. Z. xxxiii, p. 7, S.B. *L. complana*, food of; SCOWCROFT & SHELDON, Ent. xxii, p. 47.

Milionia, systematic position noticed; SNELLEN, Tijdschr. Ent. xxi, p. 399. *M. guntheri*, fig. 1, *pyrozonis*, fig. 2, *latifasciata*, fig. 3, *basalis*, fig. 4, *drucei*, fig. 5, *snelleni*, fig. 6, figured; WATERHOUSE, Aid, pl. clxxxiii.

M. luculenta, Andaman Is., SWINHOE, P. Z. S. 1889, p. 423, pl. xlii, fig. 3, n. sp.

Mitochrista miniata, larva figured, pl. xl, fig. 3, egg and larva noticed, p. 13; BUCKLER, Larvæ Brit. iii.

M. pretiosa, Dharmasala, BUTLER, p. 31, pl. cxxii, fig. 6, Ill. Lep. Het. vii, n. sp.

Nelo drucei, Loja, DOGNIN, Le Nat. 1889, p. 284, n. sp.

Nola cuculatella, fig. 3, *strigula*, fig. 4, *albulalis*, fig. 5, *centonialis*, fig. 6, *cristulalis*, fig. 7, larvæ figured, pl. xliii, metamorphoses noticed, pp. 39-44; BUCKLER, Larvæ Brit. iii.

Nudaria mundana, fig. 1, *senex*, fig. 2, larva figured, pl. xliii, noticed, p. 37; BUCKLER, Larvæ Brit. iii.

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Philea irrorella, larva figured, pl. xlii, fig. 4, noticed, p. 36; BUCKLER, Larvæ Brit. iii.

Ptychoglene pomponia, p. 89, *ira*, *pamphytia*, *phrada*, *pertunda*, p. 90, Mexico, DRUCE, Ann. N. H. (6) iv, n. spp.

Setina, note on sound-producing organ of; DÖNITZ, B. E. Z. xxxiii, p. 14, S.B. *S. dasara*, Moore, sexes figured; BUTLER, pl. cxxii, figs. 7 & 8, Ill. Lep. Het. vii.

Simareea lurida, Dharmasala, BUTLER, p. 34, pl. cxxii, fig. 10, Ill. Lep. Het. vii, n. sp.

HYPSIDÆ, MELAMERIDÆ, DIOPTIDÆ, NYCTEMERIDÆ, NYCTEBOLIDÆ

[Cf. DRUCE (202), HEYLAERTS (384), MEYRICK (567), SCHAUS (764), SWINHOE (852).]

Migoplastis hampsoni, Nilgiri hills, SWINHOE, P. Z. S. 1889, p. 402, pl. xliii, fig. 2, n. sp.

Enotrus mamitus, *splendens*, Mexico, DRUCE, p. 91, Ann. N. H. (6) iv, n. spp.

Melanchroia phæbe, Mexico, DRUCE, p. 92, Ann. N. H. (6) iv; *M. monticola*, Mexico, SCHAUS, Ent. Am. v, p. 192: n. spp.

Ephialtias coatepeca, Mexico, SCHAUS, Ent. Am. v, p. 192, n. sp.

Evagra masia, Loja, DOGNIN, Le Nat. 1889, p. 58, n. sp.

Polypetes cethegus, Mexico, SCHAUS, Ent. Am. v, p. 192, n. sp.

Pterothysanus noblei, Burmah, SWINHOE, P. Z. S. 1889, p. 401, pl. xlii, fig. 3, n. sp.

Nyctemeru lulekingyi, Sumatra, HEYLAERTS, C.R. ent. Belg. xxxiii.



p. xxvi ; *N. mesolychna*, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 466 : n. spp.

Hylophila prasinana, sound produced by ; HALL, Ent. M. M. xxv, p. 257.

LIPARIDÆ.

[Cf. BUTLER (113), HOLLAND (391), POUJADE (646), SWINHØE (852).]

Euproctis abdominalis, Moore, figured, pl. cxxiii, figs. 4 & 5 ; BUTLER, Ill. Lep. Het. vii.

Artaza scintillans, larva described, p. 123, figured, pl. cxxxviii, fig. 10 ; BUTLER, Ill. Lep. Het. vii. *A. sulphurescens*, Moore, referred to *Chærotricha*, p. 35, and figured, pl. cxxiii, figs. 6 & 7 ; BUTLER, t. c.

A. torusan, Japan, HOLLAND, Tr. Am. Ent. Soc. xvi, p. 73, n. sp.

Chærotricha ritellina, pl. cxxxviii, fig. 13, *plana*, fig. 5, larvæ figured, described, p. 122 ; BUTLER, Ill. Lep. Het. vii.

Trisuloides cerulea, Kangra, BUTLER, p. 35, pl. cxxxviii, fig. 3, Ill. Lep. Het. vii, n. sp.

Procodeca umbrina, Moore, referred to *Charnidas*, p. 36, and figured pl. cxxiii, fig. 8 ; BUTLER, Ill. Lep. Het. vii.

Liparis ? rebuti, Madagascar, POUJADE, Bull. Soc. Ent. Fr. (6) ix, p. lxiii, n. sp.

Somena abjecta, Lower Sind, SWINHØE, P. Z. S. 1889, p. 405, pl. xliii, fig. 13, n. sp.

Lymantria nigra, Moore, figured, pl. cxxiii, figs. 2 & 3, *L. concolor*, Wlk., = (*carnecolor*, Moore), p. 38 ; BUTLER, Ill. Lep. Het. vii.

L. viola, Bombay, SWINHØE, P. Z. S. 1889, p. 406, n. sp.

Charnidas exclamationsis, larva described, p. 123, figured, pl. cxxxviii, fig. 6 ; BUTLER, Ill. Lep. Het. vii.

Parorgyia dalbergia, larva described, p. 123, figured, pl. cxxxviii, fig. 12 ; BUTLER, Ill. Lep. Het. vii.

Dasychira abietis, additional generation of ; GLEISSNER, B. E. Z. xxxiii, p. 15 & 17, S.B. *D. thwaitesi*, injurious to tea, metamorphosis ; COTES, Ind. Mus. Notes, i, pp. 29-32, pl. iii, fig. 1. *D. fascelina*, fig. 1, *pudibunda*, fig. 2, larvæ figured, pl. xxxviii ; BUCKLER, Larvæ Brit. iii. *D. dalbergia*, Moore, referred to *Parorgyia*, p. 37, figured, pl. cxxiii, figs. 9-11, and larva, pl. cxxxviii, fig. 12 ; BUTLER, Ill. Lep. Het. vii. *D. kausalia*, larva described, p. 124, figured, pl. cxxxviii, fig. 7 ; BUTLER, t. c.

Demas coryli, larva figured, pl. xxxviii, BUCKLER, Larvæ Brit. iii.

Porthetria dispar, L., variation of ; LEECH, p. 127, Tr. E. Soc. 1889.

Oneria dispar, injurious in Spain ; CUNL, Act. Soc. Esp. xviii, p. 77.

Hypogymna dispar, larva figured, pl. xxxvii, fig. 6 ; BUCKLER, Larvæ Brit. iii.

Psilura monacha, larva figured, pl. xxxvii, fig. 5 ; BUCKLER, Larvæ Brit. iii.

Orgyia antiqua, fig. 1, *gonostigma*, fig. 2, larvæ figured, pl. xxxix, *antiqua*, noticed, p. 11 ; BUCKLER, Larvæ Brit. iii. *O. thyalina*, variation in wings of female ; WHITE, P. E. Soc. 1889, p. viii. *O. luco-stigma*, ravages of ; LINTNER, Fourth Rep. pp. 48-51.

Pentophora morio, L., var. *caucasica*, figured, pl. ix, fig. 4, Rom. Mem. v.
Lelia canosa, larva figured, pl. xxxix, fig. 3; BUCKLER, Larvæ Brit. iii.
Leucoma salicis var. *sohesti* noticed; ROBBE, C.R. ent. Belg. xxxiii,
 p. lxxxiv.

Stilpnolia salicis, larva figured, pl. xxxix, fig. 4; BUCKLER, Larvæ
 Brit. iii.

Porthesia chrysorrhæa, fig. 1, *auriflua*, fig. 2, larvæ figured, pl. xi;
 BUCKLER, Larvæ Brit. iii.

Epicopeia, n. sp., cf. *Uraniidæ*, &c., p. 233.

PSYCHIDÆ.

[Cf. BUTLER (113), HEYLAERTS (384), LEWIS (517), ROGENHOFER (746).]
 Larvæ of S. African species noticed; LEWIS (517).

Psyche nigricans, fig. 4, *fusca*, fig. 5, larvæ figured, pl. liii; BUCKLER,
 Larvæ Brit. iii. *P. schiffermuelleri*, notes on; HARICH, S. E. Z. I, p. 347.

Amicta febreitta n. var. *lambessa*; HEYLAERTS, C.R. ent. Belg. xxxiii,
 p. xxviii.

Fumea nitidella, larva figured, pl. liii, fig. 6; BUCKLER, Larvæ Brit. iii.

Fumea? *limulus*, Ceylon, larva and case; ROGENHOFER, SB. z.-b. Wien.
 xxxix, p. 61, n. sp.

Chalia staudingeri, Turkestan, HEYLAERTS, C.R. ent. Belg. xxxiii,
 p. lvi, n. sp.

Mahasena hockingii, Moore, figured, pl. cxxi, fig. 5, Ill. Lep. Het. vii.

NOTODONTIDÆ.

[Cf. BUTLER (113), DRUCE (202), HOLLAND (391), STAUDINGER (844).
 SWINHOE (852).]

Apatelodes torrefacta, eggs and larva described; SOULE, *Psyche*, v,
 p. 148.

Bireta nana, E. India, SWINHOE, P. Z. S. 1889, p. 407; *B. southern-*
landii, Japan, HOLLAND, Tr. Am. Ent. Soc. xvi, p. 73: n. spp.

Clostera reclusa, fig. 1, *anachoreta*, fig. 2, *curtula*, fig. 3, figured, pl. xxxvii;
 BUCKLER, Larvæ Brit. iii.

Dasylophia anguina, early stages of; DYAR, Ent. Am. v, p. 55.

Datana angusii, abundance of and habits; BINKARD, *Ins. Life*, ii, p. 149.
D. major, larva described; DYAR, Canad. Ent. xxi, p. 34.

Dicentria phraortes, Mexico, DRUCE, p. 93, Ann. N. H. (6) iv, n. sp.

Diceranura himalayana, Moore, figured, pl. cxxv, fig. 3; BUTLER, Ill.
 Lep. Het. vii.

Diloba cæruleocephala, larva figured, pl. xxxvi, fig. 1, described, p. 1;
 BUCKLER, Larvæ Brit. iii.

Euscolia, n. g., for *Rhizogramma inextricata*, Moore, which is probably
 a synonym of *Callenia saga*; BUTLER, p. 47, Ill. Lep. Het. vii.

Harpyia vinula, abdominal gland of larva; SCHÄFFER, Zool. Jahrb.
 Abth. Anat. iii, pp. 619-623.

Heterocampa basistriga, Moore, referred to *Peridea*, p. 45, figured,
 pl. cxxv, figs. 5 & 6; BUTLER, Ill. Lep. Het. vii.

Hyboma divisa, Moore, figured, pl. cxxv, fig. 7; BUTLER, Ill. Lep. Het. vii.

H. umbrifera, Dharmasala, BUTLER, p. 46, pl. cxxvi, fig. 1, Ill. Lep. Het. vii, n. sp.

Ichthyura inclusa, Hb., larva described; SOULE & ELIOT, Psyche, v, p. 261.

Janassa lignicolor, early stages; DYAR, Ent. Am. v, p. 91.

Notodonta toldii, Japan, HOLLAND, Tr. Am. Ent. Soc. xvi, p. 73, n. sp.

Peridea trepida, larva figured, pl. xxxvi, fig. 4; egg and larva noticed, p. 9; BUCKLER, Larvæ Brit. iii.

Petasia cassinea, fig. 2, *nubeculosa*, fig. 3, figured; noticed, p. 4; BUCKLER, pl. xxxvi, Larvæ Brit. iii.

Phineca canities, E. India, SWINHÖE, P. Z. S. 1889, p. 407, n. sp.

Pheosia fasciata, Moore, figured, pl. cxxv, figs. 9 & 10; BUTLER, Ill. Lep. Het. vii. *P. rimosa*, Pack., larva described; SOULE & ELIOT, Psyche, v, p. 261.

Pygma bucephala, larva figured, pl. xxxvii, fig. 4; BUCKLER, Larvæ Brit. iii.

P. modesta, Central Asia, STAUDINGER, S. E. Z. I, p. 25, n. sp.

Stauropus berberisæ, Moore, figured; BUTLER, pl. cxxv, fig. 4, Ill. Lep. Het. vii.

Tifama argentifera, Mexico, DRUCE, p. 92, Ann. N. H. (6) iv, n. sp.

Triana denticulata, Moore, figured, pl. cxxv, fig. 8, BUTLER, Ill. Lep. Het. vii.

LIMACODIDÆ, DREPANULIDÆ.

[Cf. BUTLER (113), MEYRICK (567), SNELLEN (834), SWINHÖE (852).]

Limacodes testudo, parasites of; BRIDGMAN, Ent. M. M. xxv, p. 433.

L. inornatata, G. & R., larva described; DYAR, Canad. Ent. xxi, p. 77.

Thosea rara, Burmah, SWINHÖE, P. Z. S. 1889, p. 408, pl. xliii, fig. 9, n. sp.

Parasa hockingii, Moore, figured, pl. cxxiv, fig. 4; BUTLER, Ill. Lep. Het. vii.

P. fumosa, Nilgiri Hills, SWINHÖE, P. Z. S. 1889, pl. xliii, fig. 12, n. sp.

Cania pulligonia, E. India, SWINHÖE, P. Z. S. 1889, p. 408, pl. xliii, figs. 7 & 8, n. sp.

Aphendala fuscata, Moore, figured, pl. cxxiv, fig. 6; BUTLER, Ill. Lep. Het. vii.

Miresa suffusa, Moore, referred to *Cania*, p. 41, and figured, pl. cxxiv, fig. 5; BUTLER, Ill. Lep. Het. vii.

M. crispa, pl. xliii, fig. 4, *propeza*, E. India, SWINHÖE, P. Z. S. 1889, p. 409, n. spp.

Eurabila n. g. (*Limacodidæ*), p. 39, for *E. lignea*, n. sp., Dharmasala, p. 40, pl. cxxviii, fig. 6; BUTLER, Ill. Lep. Het. vii.

Heterogenes asellus, larva figured, pl. liii, fig. 7, metamorphoses described, pp. 73-76; BUCKLER, Larvæ Brit. iii.

Limacodes testudo, larva figured; BUCKLER, Larvæ Brit. pl. liii, fig. 8.

Lagon opercularis, habits, stinging powers, &c. ; LINTNER, Fourth Rep. pp. 51-54.

Hydroclaila n. g. (*Cochliopodidae*), p. 456, for *H. antigona*, n. sp., Pet. Moresby, p. 457 ; MEYRICK, Tr. E. Soc. 1889.

Autocopa, n. g. (*Cochliopodidae*), for *A. monoloncha*, n. sp., N. Guinea; MEYRICK, p. 457, Tr. E. Soc. 1889.

Drapetodes, Guen., referred to *Drepanulidæ* ; SNELLEN, Tijdschr. Ent. xxxii, p. 11.

Platypteryz lacertinaria, larva figured, pl. lii, fig. 3 ; BUCKLER, Larvæ Brit. iii.

Platypteryz argenteilinea, p. 8, pl. i, fig. 2, *cilicoides*, p. 9, fig. 3, Jan, SNELLEN, Tijdschr. Ent. xxxii, n. spp.

Pseuderosia, neuration and characters described ; SNELLEN, Tijdschr. Ent. xxxii, p. 15.

P. cristata, Java, SNELLEN, l. c. pl. i, figs. 6 & 6a, n. sp.

Phyllopteryz elongata, Java, SNELLEN, Tijdschr. Ent. xxxii, p. 14, pl. i, fig. 5, n. sp.

Ciliz spinula, larva figured, pl. lii, fig. 2 ; BUCKLER, Larvæ Brit. iii.

Drepana sicula, pl. lii, fig. 4, *falcataria*, pl. liii, fig. 1, *hamula*, fig. 2, *unguicula*, fig. 3, larvæ figured, metamorphoses of *sicula* noticed, pp. 66-72 ; BUCKLER, Larvæ Brit. iii. *D. lilacina*, fig. 8, *simillima*, Moore, fig. 9, figured ; BUTLER, pl. cxxiv, Ill. Lep. Het. vii.

Agnidra violacea, Dharmasala, BUTLER, p. 42, pl. cxxiv, fig. 7, Ill. Lep. Het. vii, n. sp.

Peridrepana, n. g., for *Drepana hyalina*, Moore ; BUTLER, p. 43, Ill. Lep. Het. vii. The insect figured, pl. cxxv, fig. 1, l. c.

Macrauzata, n. g., for *Comibana fenestraria*, Moore ; BUTLER, p. 43, Ill. Lep. Het. vii.

Teldenia aulogramma, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 467, n. sp.

Problepsis, n. sp., cf. *Geometridæ*.

SATURNIIDÆ, ENDROMIDÆ, CERATOCAMPIDÆ.

[Cf. BORGGREVE (90), BUTLER (113, 115), SCHAUS (764).]

Samia cynthia, list of its food-plants ; BEUTENMÜLLER, Ent. Am. v, pp. 226 & 227.

Callosamia angulifera, preparatory stages ; BEUTENMÜLLER, Ent. Am. v, p. 200 : larva described ; SOULE & ELIOT, Psyche, v, p. 260. *C. promethea*, second brood of ; HINKLEY, Psyche, v, p. 280.

Platysamia œcropia, L., descriptive and economical note ; LABOULENÈZE, Rev. Sci. Nat. App. xxxvi, pp. 353-359.

Attacus cynthia, *pryeri*, *walkeri*, varietal note ; LEECH, p. 128, Tr. E. Soc. 1889. *A. orizaba*, Westw., noticed and figured ; GRISARD, Rev. Sci. Nat. App. xxxvi, pp. 630-633.

Antherea yama-mai, notes on larvæ and habits ; WEBSTER, *Ins. Life*, i, pp. 273 & 277.

Saturnia hockingii, Moore, figured, pl. cxxiv, figs. 2 & 3 ; BUTLER, Ill. Lep. Het. vii. *S. wallengrenii*, Feld., ♂ described ; BUTLER, Tr. E. Soc.

1889, p. 391. *S. mylitta*, early stages noticed; HART, J. Bomb. N. H. Soc. iv, p. 287. *S. carpini*, larva figured, pl. lii, fig. 1; BUCKLER, Larvæ Brit. iii.

Dirphia crinita, Berg. = (*Saturnia hyadesi*, Mab.); BERG, p. cxxi, Bull. Soc. Ent. Fr. (6) ix.

Ceranchia mollis, Mombaza, BUTLER, Tr. E. Soc. 1889, p. 391, pl. xii, fig. 5, n. sp.

Hylesia bouvereti, Loja, DOGNIN, Le Nat. 1889, p. 58, n. sp.

Aglaia tau, search of ♀ by ♂; BORGGREVE (90).

Endromia versicolor, larva figured, pl. li, fig. 3, metamorphoses described, pp. 60-66; BUCKLER, Larvæ Brit. iii.

Rhodina newara, Moore, cocoons noticed; P. E. Soc. 1889, p. xxiv.

Brahma ocelligera, Mombaza, BUTLER, Tr. E. Soc. 1889, p. 390, pl. xii, fig. 4, n. sp.

Eacles ormondei, Mexico, SCHAUS, Ent. Am. v, p. 192, n. sp.

LASIOCAMPIDÆ and BOMBYCIDÆ.

[Cf. HEYLAERTS (383), ORMEROD (614).]

Bombyx populi, L., n. var. *calbertæ*; RAGUSA, Nat. Sicil. viii, p. 223, pl. iii, figs. 1 & 2. *B. lanestris*, prolongation of pupal state; SPEYER, S. E. Z. i, p. 140. *B. franconia*, note on larval habits; DUEBERG, B. E. Z. xxxiii, p. 4, S.B. *B. rubi*, food-plant of larva; FALLOU, Bull. Soc. Ent. Fr. (6) ix, p. xxii. *B. quercus*, L., note on a var. of (? *callunæ*, Palm.); KEMPELEN, p. 145, Wien. ent. Z. viii: hermaphrodite described and figured; RIBBE, Deutsche e. Z. Lep. 1889, p. 186, pl. iv, fig. 5. *B. alpica*, Stgr., n. var.; BLACHIER, Ann. Soc. Ent. Fr. (6) ix, p. 256, pl. iv, fig. 6.

Crateronyx ballioni, Chr., noticed, p. 200, figured, pl. x, fig. 2; CHRISTOPH, Rom. Mem. v.

Gastropacha quercifolia, L., embryology; GRABER (329). *G. quercifolia*, fig. 1, *ilicifolia*, fig. 2, larvæ figured, pl. li; BUCKLER, Larvæ Brit. iii. *G. pini*, barren females of, near Berlin; THIELE, B. E. Z. xxxiii, p. 7. *G. quercus*, hermaphrodite described; BERTKAU (61).

Clisiocampa thoracica, Stretch, larva described; RIVERS, Proc. Cal. Ac. Sci. (2) i, p. 105. *C. sylvatica*, Har., habits, &c.; LINTNER, Rep. N. Y. Mus. xl, p. 91. *C. castrensis*, pl. i, fig. 1, *neustria*, fig. 2, larvæ figured; BUCKLER, Larvæ Brit. iii.

Lasiocampa pini, variety; GAUCKLER, Soc. Ent. iii, p. 147. *L. pruni*, and *populifolia*, additional generation obtained; GLEISSNER, B. E. Z. xxxiii, p. 15, S.B. *L. rubi*, pl. xlvii, fig. 4, *trifolii*, pl. xlvii, fig. 1, *quercus*, fig. 2, *quercus* var. *callunæ*, fig. 3, figured, larvæ of the latter two noticed, pp. 56 & 58; BUCKLER, Larvæ Brit. iii. *L. rubi*, hybernation of; POLLACK, JB. westf. Ver. 1886, p. 19. *L. otus*, Dr., life-history; DELAGRANGE, Rev. Sci. Nat. App. xxxvi, pp. 534-540.

Eriogaster lanestris, larva figured, pl. xlviii, fig. 1; BUCKLER, Larvæ Brit. iii.

Pæcilocampa populi, larva figured, pls. xlviii, fig. 2, & xlix, fig. 1, described, p. 58; BUCKLER, Larvæ Brit. iii.

Trichiura cratægi, larva figured, pl. xlix, fig. 2; BUCKLER, *Larvæ Brit.* iii.

Odonestis potatoria, larva figured, pl. l, fig. 3, egg noticed, p. 60; BUCKLER, *Larvæ Brit.* iii.

Suana riemsdyki, Sumatra, HEYLAERTS, *C.R. ent. Belg.* xxxiii, p. xiv, n. sp.

Eupterote fraterna, Moore, figured, pl. cxxiii, fig. 1; BUTLER, *Ill. Lep. Het.* vii.

Taragama castanoptera, Moore, figured, pl. cxxiv, fig. 1; BUTLER, *Ill. Lep. Het.* vii.

Theophila mandarina, note on its locality and habits; KENNEDY & EMENS, *Ins. Life*, i, pp. 270-272.

Trilocha ficiola, S. Africa, JANSON, Ormerod's *Inj. Ins. S. Afr.* pp. 43-46, n. sp.

Bombyx mori, double cocoons; BLANCHARD (80), and FALLOU, in *Bull. Soc. Ent. Fr.* 1889, pp. lxxiii & ci: embryology; GRABER (329); spermatogenesis in; VERNON (879).

ZEUZERIDÆ, HEPIALIDÆ.

[*Cf.* CHRISTOPH (146, 748), DOGNIN (193), DRUCE (202).]

Zeuzera æsculi, destroyer of the larva of; BARRETT, *Ent. M. M.* xiv, p. 456.

Endagria bipunctata, Stgr., = (*colon*, Chr.), p. 200, figured, pl. ix, fig. 3; CHRISTOPH, *Rom. Mem.* v.

E. colon, Ordubot, CHRISTOPH, *Hor. Ent. Ross.* xxiii, p. 300, n. sp.

Lungsdorfia adornata, Loja, DOGNIN, *Le Nat.* 1889, p. 211, n. sp.

Cossus ligniperda, larva of aberrant colour, noticed; DURRANT, *P. E. Soc.* 1889, p. vi.

Holcocerus inspersus, Achal Tekke, CHRISTOPH, *Rom. Mem.* v, p. 15, pl. i, fig. 6, n. sp.

Hepialus nebulosus, Alph., fully described; ALPHÉRAKY, *Rom. Mem.* v, p. 85. *H. schamyl*, Chr., described at length and figured, p. 198, pl. x, figs. 1, a & b; CHRISTOPH, *Rom. Mem.* v. *H. argenteo-maculatus*, larva and pupa; KELLICOTT, *Ins. Life*, i, p. 250.

Phassus smithi, Mexico, DRUCE, p. 92, *Ann. N. H.* (6) iv, n. sp.

CYMATOPHORIDÆ.

[*Cf.* BUTLER (113), DRUCE (324).]

Gonodonta elegans, Centr. & S. America, DRUCE, p. 257, pl. xxvi, fig. 1, *Biol. Centr. Am. Heter.* i, n. sp.

Thyatira pudens, Gn., note on larva; DYAR, *Canad. Ent.* xxi, p. 209. *T. repugnans*, Wlk., referred to *Risoba*, Moore; MEYRICK, *Tr. E. Soc.* 1889, p. 472. *T. batia*, var. *cognata*, Moore, figured, pl. cxxv, fig. 12; BUTLER, *Ill. Lep. Het.* vii.

T. hersilia, Guatemala, pl. xxvi, fig. 2, *heurippa*, fig. 3, *T.* (?) *hypatia*, fig. 4, Panama, DRUCE, p. 258, *Biol. Centr. Am. Heter.*, n. spp.

Habrosyne fraterna, Moore, figured, pl. cxxv, fig. 11; BUTLER, Ill. Lep. Het. vii.

Polyplocæ, note on the genus, p. 48; *P. (Palimpsestis) orbicularis*, fig. 2, *renalis*, Moore, fig. 4, *albidisca*, Warren, fig. 3, figured, pl. cxxvi; BUTLER, Ill. Lep. Het. vii.

NOCTUIDÆ.

[*Cf.* ALPHÉRAKY (748), BUTLER (113, 114), CHRISTOPH (748), CLARK (149), DOGNIN (193), DRUCE (202, 324), FRENCH (289), GRAESER (330), GROTE (339), HOLLAND, (301), LEECH (484, 485), MABILLE (539), MEYRICK (567), OLLIFF (613), ROGENHOFER (745), SMITH (829, 830), SNELLEN (833), STAUDINGER (844), SWINHOE (852), WARREN (896).]

Bryophila perla, var. described; FUCHS, JB. nass. Ver. xlii. pp. 208 & 209. *B. alga*, F., var. *canaria* described, p. 224; figured, pl. xi, fig. 5; CHRISTOPH, Rom. Mem. v.

B. simonyi, Teneriffe, ROGENHOFER, SB. z.-b. Wien, xxxix, p. 36, n. sp. *Declana floccosa*, variation noticed and figured; HUDSON, Tr. N. Z. Inst. xxi, pp. 190-193, pl. ix.

Grammophora chaldæa, Costa Rica, DRUCE, p. 259, pl. xxvi, fig. 5, Biol. Centr. Am. Heter., n. sp.

Panthea pythion, Panama, DRUCE, p. 259, pl. xxvi, fig. 6, Biol. Centr. Am. Heter., n. sp.

Selepa manleyi, Japan, LEECH, P. Z. S. 1889, p. 479, pl. lii, fig. 1, n. sp.

Moma confusa, Japan, LEECH, P. Z. S. 1889, p. 480, pl. l, fig. 5, n. sp.

Mythimna grandis var. (= *divergens*, Butl.); LEECH, P. Z. S. 1889, p. 480.

Raphia approximata, Alph., noticed, p. 124, figured, pl. vi, fig. 1; ALPHÉRAKY, Rom. Mem. v.

Acronycta eleagni, Alph., described at length and figured, p. 126, pl. vi, fig. 2, *rumicis* var. *turanica* figured, pl. viii, fig. 5; ALPHÉRAKY, Rom. Mem. v. *A.* (sub *Thalpophila*) *digna*, Butl., = *michaël*, Oberth.; LEECH, P. Z. S. 1889, p. 476.

A. carbonaria, Amurland, GRAESER, B. E. Z. xxxiii, p. 252; *A. subornata*, Japan and Corea, LEECH, P. Z. S. 1889, p. 477, pl. l, fig. 6; *A. dolens*, Mexico, pl. xxvi, fig. 7, *dadala*, Guatemala, fig. 8, DRUCE, p. 260, Biol. Centr. Am. Heter.: n. spp.

Apatela felina, Gr., descriptive note; FRENCH, Canad. Ent. xxi, p. 36.

Aletia exanthemata, Moore, fig. 6, *rudis*, figs. 7 & 8, *fraterna*, fig. 9, figured, pl. cxxvi; BUTLER, Ill. Lep. Het. vii.

Leucania extincta, Guén., = (*insueta*, *linita*, *scirpicola*, Guén.), p. 261, *L. diffusa*, Walk., figured, pl. xxvi, fig. 10; DRUCE, Biol. Centr. Am. Heter. *L. flavostigma* n. var. *inornata*, P. Z. S. 1889, p. 482, pl. l, fig. 7. *L. percisa*, Moore, figs. 10 & 11, *irrorata*, fig. 12, *bifasciata*, fig. 13, figured, pl. cxxvi; BUTLER, Ill. Lep. Het. vii.

L. melania, *putrida*, Central Asia, STAUDINGER, p. 48, S. E. Z. l; *L. simplex*, Kiukiang, LEECH, p. 130, Tr. E. Soc. 1889; *L. nigrilinea*, Japan, LEECH, P. Z. S. 1889, p. 482, pl. l, fig. 8; *L. multipunctata*, Panama, DRUCE, p. 261, pl. xxvi, fig. 11, Biol. Centr. Am. Heter.: n. spp.

Tympanistes rubidorsalis, figured, pl. cxvi, fig. 5; BUTLER, Ill. Lep. Het. vii.

Tapinostola muscosa n. var. *lata*; ALPHÉRAKY, Rom. Mem. v, p. 165.

T. procera, Central Asia, STAUDINGER, S. E. Z. I, p. 47, n. sp.

Gortyna and *Ochria*, notes on the genera and the N. American species; GROTE, Canad. Ent. xxi, pp. 139 & 140. *G. ditissima*, Wlk., figured, pl. xxvi, fig. 9; Biol. Centr. Am. Heter.

G. edentata, Japan, LEECH, P. Z. S. 1889, p. 485, pl. li, fig. 9, n. sp.

Ochria ochracea, Hb., = (*fortis*, Butl.); LEECH, P. Z. S. 1889, p. 485.

Hydræcia ochreola, Stgr., = (*Luperina renalis*, Alph.), p. 164, figured, pl. vii, fig. 6; ALPHÉRAKY, Rom. Mem. v. *H. micacea*, injurious in Sweden; LAMPA, Ent. Tidskr. x, pp. 7 & 8.

Arzama obliquata, habits; KELLCOTT, p. 39, Canad. Ent. xxi, and BREHME, Canad. Ent. xxi, p. 78, JOHNSTON, t. c. p. 79: metamorphoses; WEED, Bull. Ohio Exp. Station, i, pp. 5-7, pl. i, fig. 2: mature larva described; BEUTENMÜLLER, Canad. Ent. xxi, p. 160.

Nephelodes violans, larva, habits, description; LINTNER, Fourth Rep. pp. 54-57.

Axylia putris, variation in Britain; TUTT, Ent. xxii, p. 9.

Xylophasia sublustris, *lithozylea*, pp. 10-12, *monoglyphæ*, p. 41, *ruræa*, pp. 58-62, *hepatica*, p. 94, *scolopacina*, p. 95, *zollikoferi*, p. 96, variation in Britain; TUTT, Ent. xxii.

X. tychoona, Japan, LEECH, P. Z. S. 1889, p. 488, pl. li, fig. 3; *X. repetita*, Dharmasala, BUTLER, p. 53, pl. cxxvii, figs. 1 & 2, Ill. Lep. Het. vii; *X. torresi*, Loja, DOGNIN, Le Nat. 1889, p. 82: n. spp.

Dipterygia scabriuscula, L., variation of; TUTT, Ent. xxii, p. 97.

D. japonica, Japan, LEECH, P. Z. S. 1889, p. 489, pl. l, fig. 9, n. sp.

Neuria reticulata, variation in Britain; TUTT, Ent. xxii, p. 134.

N. auripicta, Dharmasala, BUTLER, p. 53, pl. cxxvii, fig. 3, Ill. Lep. Het. vii, n. sp.

Nasia moesta, Wlk., figured, pl. xxvi, fig. 12; Biol. Centr. Am. Heter.

N. dolens, Costa Rica, DRUCE, p. 266, pl. xxvi, fig. 13, Biol. Centr. Am. Heter., n. sp.

Dargida niphanda, Panama, pl. xxvi, fig. 14, *amphion*, Mexico, fig. 15, p. 270, *sarepta*, Panama, fig. 16, *porphyra*, Centr. America, fig. 17, *iamna*, Guatemala, fig. 18, p. 271, DRUCE, Biol. Centr. Am. Heter., n. spp.

Neuronia popularis, variation; TUTT, Ent. xxii, p. 135.

Heliophobus hispida, variation; TUTT, Ent. xxii, pp. 136-138.

H. unctus, Achal Tekke, CHRISTOPH, Rom. Mem. v, p. 25, pl. ii, fig. 1;

H. hipparis, Mexico, DRUCE, p. 272, pl. xxvi, fig. 19, Biol. Centr. Am. Heter.: n. spp.

Phleboëis, n. g., p. 27, for *P. petersi*, n. sp., Achal Tekke, p. 28, pl. ii, fig. 3; CHRISTOPH, Rom. Mem. v.

Charaas graminis, variation in Britain; TUTT, Ent. xxii, pp. 152-155.

Pachetra leucophaea, variation in Britain; TUTT, Ent. xxii, pp. 155-157.

Luperina testacea var. *nickerlii*, note on; SOUTH, Ent. xxii, p. 271. *L. luteago* and *dumerilii*, pp. 180-182, *cespitis*, p. 204, *testacea*, pp. 205-208, variation in Britain; TUTT, Ent. xxii. *L. siri*, Ersch., figured, pl. ii, fig. 5; Rom. Mem. v.

L. immunis, p. 40, *peca*, p. 41, Central Asia, STAUDINGER, S. E. Z. 1, n. spp.

Cerigo matura, variation in Britain; TUTT, Ent. xxii, p. 179.

Oncocnemis, the N. American species revised; SMITH, Tr. Am. Ent. Soc. xvi, pp. 321-348, with figures of the male organs on pl. viii.

Dianthæcia nivescens, Dharmasala, BUTLER, p. 58, pl. cxxviii, fig. 2, Ill. Lep. Het. vii, n. sp.

Mamestra, synonymy of various species; BUTLER, Tr. E. Soc. 1889, pp. 385-387. *M. spalar*, Alph., described at length, p. 144, and figured, pl. vi, fig. 5; ALPHÉRAKY, Rom. Mem. v. *M. brassica*, L., n. var. *decolorata*, p. 34, *sabulorum*, Alph., n. var. *distincta*, p. 35; STAUDINGER, S. E. Z. 1. *M. abjecta*, pp. 208-210, *sordida*, pp. 229-231, *furva*, p. 231, *albicolon*, p. 232, *brassica*, pp. 250 & 251, *persicaria*, p. 252, variation in Britain; TUTT, Ent. xxii. *M. implexa*, Hb., figured, pl. xii, fig. 1, redescribed, pp. 233-236; Rom. Mem. v. *M. configurata*, Wlk., figured, pl. xxvi, fig. 20, Biol. Centr. Am. Heter.

M. mista, p. 35, *furcula*, p. 36, Centr. Asia, STAUDINGER, S. E. Z. 1; *M. terranea*, Dharmasala, BUTLER, p. 53, pl. cxxvii, fig. 10, Ill. Lep. Het. vii; *M. cuneata*, Japan, LEECH, P. Z. S. 1889, p. 486, pl. 1, fig. 12; *M. dotata*, Centr. America, pl. xxvi, fig. 21, *hipparion*, Costa Rica, fig. 24, DRUCE, p. 273, Biol. Centr. Am. Heter. : n. spp.

Tiracola plagiata, Wlk., = (*Agrotis plagifera*, *spectabilis*, Wlk.), p. 287, figured, pl. xxvii, fig. 14; DRUCE, Biol. Centr. Am. Heter.

T. violacea, Dharmasala, BUTLER, p. 54, pl. cxxvii, fig. 5, Ill. Lep. Het. vii, n. sp.

Apamea askoldis, Oberth., = (*nivalis*, Butl.) ; LEECH, P. Z. S. 1889, p. 490. *A. basilinea*, pp. 254 & 255, *pabulatricula*, p. 276, *unaninis*, p. 277, *gemina*, pp. 302-305, variation in Britain; TUTT, Ent. xxii.

A. minima, E. India, SWINHOE, P. Z. S. 1889, p. 410, n. sp.

Centropus, n. g., near *Apamea*, for *X. scripturosa*, Ev., figured, pl. ii, figs. 4a & b, and *Epimecia argillacea*, Chr.; CHRISTOPH, Rom. Mem. v, p. 30. [Name preoccupied.]

Hydrilla cinerea, Alph., described at length, p. 168, and figured, pl. viii, fig. 3; ALPHÉRAKY, Rom. Mem. v.

Rusina ripleyi, Japan, HOLLAND, Tr. Am. Ent. Soc. xvi, p. 74, n. sp.

Triphana comes, Hb., varietal note and figures; CLARK, Ent. xxii, pp. 145-147, pl. vi.

T. fuscicollis, Dharmasala, BUTLER, p. 56, pl. cxxvii, fig. 4, Ill. Lep. Het. vii, n. sp.

Triphanopsis inepta, figs. 6 & 7, *diminuta*, figs. 8 & 9, Dharmasala, BUTLER, pl. cxxvii, p. 55, Ill. Lep. Het. vii, n. spp.

Glottula squalida, Japan, LEECH, P. Z. S. 1889, p. 490, pl. lii, fig. 3, n. sp.

Miana pulchra, Centr. America, pl. xxvi, fig. 22, *zonella*, Costa Rica, fig. 23, DRUCE, p. 274, Biol. Centr. Am. Heter., n. spp.

Celana rubens, pl. xxvi, fig. 25, p. 274, *perta*, fig. 26, *hamara*, fig. 27, *oriza*, fig. 28, Mexico, *esopsis*, pl. xxvii, fig. 1, p. 275, *minuta*, fig. 2, p. 276, Guatemala, DRUCE, Biol. Centr. Am. Heter., n. spp.

Perigea gemella, Japan and Corea, LEECH, P. Z. S. 1889, p. 492, pl. liii,

fig. 12 ; *P. hippia*, pl. xxvii, fig. 3, p. 277, *fidelia*, fig. 4, Panama, *berisala*, fig. 5, Centr. America, p. 278, DRUCE, Biol. Centr. Am. Heter. : n. spp.

Meristis fea, Centr. America, DRUCE, p. 279, pl. xxvii, fig. 6, Biol. Centr. Am. Heter., n. sp.

Monodes citrina, Guatemala, pl. xxvii, fig. 7, *monyma*, Centr. America, fig. 8, DRUCE, Biol. Centr. Am. Heter., n. spp.

Peridroma ypsilon, synonymy ; BUTLER, Tr. E. Soc. 1889, p. 380.

Agrotis : the synonymy of many species discussed, with observations on the extent of allied genera ; BUTLER, Tr. E. Soc. 1889, pp. 376-380.

A. adumbrata, Ev., var. = (*polygonides*, Stgr.), p. 128, *xanthographa*, F., var. *elutior*, figured, pl. vi, fig. 3, *la-ciea*, Stgr., pl. viii, fig. 10, *junonia*, Stgr., pl. viii, fig. 7, *birivia* var. *plumbea*, Alph., pl. vi, fig. 4, *islandica* var. *rossica*, Stgr., pl. vii, fig. 3, *tritici*, L., n. var. *caria*, described, p. 138, figured, pl. vii, fig. 1, *multicuspis*, Ev., = (*spinosa*, Stgr.), p. 141 ; ALPHÉRAKY, Rom. Mem. v. *A. obscura*, Br., = (*Graphiphora valida*, Wlk., and *caliginea*, Butl.) ; LEECH, P. Z. S. 1889, p. 500. *A. hispidula*, Gn., = (*bicolor*, Mab.) ; BERG, Bull. Soc. Ent. Fr. (6) ix, p. cxxl. *A. semidolens*, Wlk., figured, pl. xxvii, fig. 13 ; Biol. Centr. Am. Heter. *A. sollers* var. *candida*, Stgr., var. ? *obumbrata*, var. *obscurior*, p. 27, *ala*, Stgr., var. ? *latifica*, p. 29, *mustelina*, Chr., var. *centralis*, p. 34, described ; STAUDINGER, S. E. Z. 1. *A. cursoria*, varietal note ; RIESEN, S. E. Z. 1, p. 346. *A. ptychous*, larva described ; BEUTENMÜLLER, Ent. Am. v, p. 38. *A. subgothica*, as British ; BARRETT, Ent. M. M. xxv, p. 224, and DALE, *l. c.* p. 246. *A. exclamationis*, injuries of to linen in Ireland ; BARRETT (30).

A. karschi, Amurland, GRAESER, B. E. Z. xxxiii, p. 253 ; *A. arvicola*, p. 18, pl. i, fig. 7, *indigna*, p. 20, fig. 8, *glaucescens*, p. 23, fig. 9, Achal Tekke, CHRISTOPH, Rom. Mem. v ; *A. degenerata*, p. 26, *musculus*, p. 30 (figured and described by ALPHÉRAKY, Rom. Mem. v, p. 133, pl. vii, fig. 2, as *A. citillus*), *issykula*, p. 31 (= *multicuspis*, Ev., ALPHÉRAKY, Rom. Mem. v, p. 141), *superba*, p. 32, Centr. Asia, STAUDINGER, S. E. Z. 1 : *A. rattus*, Thibet, ALPHÉRAKY, Rom. Mem. v, p. 86 ; *A. informis*, pl. i, fig. 1, with var. *confluens*, p. 500, *undosa*, pl. i, fig. 3, p. 50, Japan, LEECH, P. Z. S. 1889 ; *A. obscurus*, Loja, DOGNIN, Le Nat. 1889, p. 67 ; *A. manethusa*, ol. xxvii, fig. 9, p. 284, *oroba*, fig. 10, *ornea*, fig. 11, *altes*, fig. 12, p. 285, Mexico, *splendens*, Panama, fig. 15, p. 286, DRUCE, Biol. Centr. Am. Heter. : n. spp.

Spaelotis ambigua, Dharmasala, BUTLER, p. 53, pl. cxxviii, figs. 10 & 11, Ill. Lep. Het. vii ; *S. sincera*, Simla, SWINHOE, P. Z. S. 1889, p. 411 : n. spp.

Chernotis nivisparva, Dharmasala, BUTLER, p. 54, pl. cxxvii, fig. 11, Ill. Lep. Het. vii, n. sp.

Noctua tarda, Hakodate, LEECH, P. Z. S. 1889, p. 495, pl. i, fig. 4, n. sp.

Amathes, Hb. (*Noctua*, auct.), synonymy of various species given ; BUTLER, Tr. E. Soc. 1889, pp. 382 & 383.

Graphiphora dahlii, Hb., var. = (*canescens*, Butl.), p. 497, *illoba*, Butl., = (*pacifica*, Butl.), p. 498 ; LEECH, P. Z. S. 1889.

G. variaria, E. India, SWINHOE, P. Z. S. 1889, p. 412, n. sp.

Hermomassa cecilia, Butl., = (*arenosa*, Butl.) ; LEECH, P. Z. S. 1889, p. 498.

- Ochropleura ignota*, Ceylon, SWINHOE, P. Z. S. 1889, p. 411, n. sp.
Pachnobia, its extent; BUTLER, Tr. E. Soc. 1889, p. 380.
P. mandschurica, Raddefka, GRAESER, B. E. Z. xxxiii, p. 256, n. sp.
Taniocampa gracilis, Fab., = (*ella*, Butl.), *instabilis*, Esp., = (*evanida*, Butl.); LEECH, p. 512, P. Z. S. 1889.
T. (?) lineata, Panama, DRUCE, p. 288, pl. xxvii, fig. 16, Biol. Centr. Am. Heter., n. sp.
Semiophora orthosioides, Dharmasala, BUTLER, p. 56, pl. cxxviii, fig. 1, Ill. Lep. Het. vii, n. sp.
Helotropa leucostigma, Hb., = (*Cerastis larvis*, Butl.); LEECH, P. Z. S. 1889, p. 485.
Cerastis albipuncta, Japan, LEECH, P. Z. S. 1889, p. 514, pl. li, fig. 10, n. sp.
Orthosia fausta, Japan, LEECH, P. Z. S. 1889, p. 513, pl. l, fig. 2, n. sp.
Anchocelis tenuis, N. India, BUTLER, p. 57, pl. cxxvii, fig. 12, Ill. Lep. Het. vii, n. sp.
Orthodes lodebar, Centr. America, DRUCE, p. 289, pl. xxvii, figs. 17 & 18, Biol. Centr. Am. Heter., n. sp.
Xanthia tunicata, Amurland, GRAESER, B. E. Z. xxxiii, p. 259, n. sp.
Hiptelia grumi, Alph., described at length, p. 170, figured, pl. vii, fig. 7; ALPHÉRAKY, Rom. Mem. v.
Xestia melonina, Dharmasala, BUTLER, p. 57, pl. cxxviii, fig. 7, Ill. Lep. Het. vii, n. sp.
Atethmia subusta, Hb., = (*Anthophila erecta*, *Poaphila congesta*, and *Laphygma trilinea*, Wlk.); DRUCE, p. 290, Biol. Centr. Am. Heter.
Mesogona quadrilinea, LEECH, P. Z. S. 1889, p. 519, pl. li, fig. 1, n. sp.
Elydna diurna, E. India, SWINHOE, P. Z. S. 1889, p. 412, n. sp.
Cosmia subtilis, Stgr., figured, pl. vii, fig. 8; Rom. Mem. v. *C. affinis*, larva described; PORRITT, Ent. M. M. xxv, p. 298.
C. pembertonii, Japan, HOLLAND, Tr. Am. Ent. Soc. xvi, p. 75; *C. albipennis*, Dharmasala, BUTLER, p. 58, pl. cxxvii, fig. 13, Ill. Lep. Het. vii; n. spp.
Ipimorpha retusa, L., = (*Cosmia curvata*, Butl.); LEECH, P. Z. S. 1889, p. 516.
Calymnia camptosigma, Mén., = (*distincta*, Butl.); *trapezina*, L., = (*Mesogona exigua*, Butl.); LEECH, P. Z. S. 1889, p. 515.
C. falcata, p. 257, *pyrausta*, p. 258, Amurland, GRAESER, B. E. Z. xxxiii; *C. pryeri*, Japan, LEECH, P. Z. S. 1889, p. 516, pl. li, fig. 11; *C. bicon*, Mexico, DRUCE, p. 295, Biol. Centr. Am. Heter.: n. spp.
Dyschorista plebeia, Stgr., figured, pl. vii, fig. 9; Rom. Mem. v.
Hecatera fasciata, Kiukiang, LEECH, p. 134, pl. ix, fig. 8, Tr. E. Soc. 1889; *H. hodeva*, Guatemala, fig. 21, *hoshea*, Panama, fig. 22, p. 291, pl. xxvii, DRUCE, Biol. Centr. Am. Heter.: n. spp.
Phoebophilus amicus figured, pl. viii, fig. 4; Rom. Mem. v.
Comophorus villosus, Alph., the genus and species discussed, pp. 149-152, the latter figured pl. vi, figs. 6, a, b; ALPHÉRAKY, Rom. Mem. v.
Polia chamaleon, Alph., p. 153, pl. vi, figs. 8, a, b, *tenuicornis*, Alph., p. 155, pl. vi, fig. 9, described at length and figured, *centralasia*, Stgr.,

ab., = (*asiatica*, Alph.), p. 157, figured, pl. vi, fig. 7; ALPHÉRAKY, Rom. Mem. v.

P. simplex, Central Asia, STAUDINGER, S. E. Z. 1, p. 39, n. sp.

Dasythorax, n. g., near *Polia*, for *D. polianus*, n. sp., Central Asia; STAUDINGER, p. 38, S. E. Z. 1.

Epunda lichenea, food-plant; BIGNELL, Ent. xxii, p. 139.

E. mamestrina, Dharmasala, BUTLER, p. 59, pl. cxxviii, fig. 5, Ill. Lep. Het. vii, n. sp.

Euplexia lucipara, L., preparatory stages; DYAR, Canad. Ent. xxi, p. 137.

E. japonica, Japan, LEECH, P. Z. S. 1889, p. 504, n. sp.

Eurois exclusa, Kiukiang, LEECH, p. 132, pl. ix, fig. 9, Tr. E. Soc. 1889, n. sp.

Agriopsis viridis, Japan, LEECH, P. Z. S. 1889, p. 502, pl. li, fig. 6, n. sp.

Miselia cortex, Alph., described at length, p. 159, and figured, pl. vii, fig. 4; ALPHÉRAKY, Rom. Mem. v.

M. funesta, Japan, LEECH, P. Z. S. 1889, p. 503, pl. li, fig. 7, n. sp.

Lamprostricta venusta, Japan, LEECH, p. 504, pl. li, fig. 5, P. Z. S. 1889, n. sp.

Gonitis pryeri, pl. lii, fig. 8, *distincta*, fig. 7, Japan, LEECH, P. Z. S. 1889, p. 506, n. sp.

Berrhaea japonica, Japan, LEECH, P. Z. S. 1889, p. 507, pl. l, fig. 11, n. sp.

Valeria laches, Panama, pl. xxvii, fig. 20, *uscona*, Costa Rica, fig. 23, p. 292, DRUCE, Biol. Centr. Am. Heter., n. spp.

Polyphania respondens, Wlk., figured, pl. xxvii, fig. 24; Biol. Centr. Am. Heter.

Hadena christophi, Alph., described at length, p. 236, figured, pl. xii, figs. 2, a, b; ALPHÉRAKY, Rom. Mem. v. *H. arshanica*, Alph., referred to *Neuronis*; ALPHÉRAKY, Rom. Mem. v, p. 144. *H. adusta*, Esp., var. = (*Mamestra vicina*, Alph.); ALPHÉRAKY, Rom. Mem. v, p. 163. *H. basilinea*, F., n. var. *grisescens*, p. 42, *rurea*, F., n. var. *extincta*, p. 43; STAUDINGER, S. E. Z. 1. *H. gemnea*, larva described; WERNER, Soc. Ent. iv, p. 112. *H. atriplicis* and *litargyria* (sic), scent-apparatus in; LANDOIS, JB. westf. Ver. 1886, p. 16.

H. haelsseni, p. 254, *succincta*, p. 255, Amurland, GRAESER, B. E. Z. xxxiii; *H. unica*, pl. li, fig. 12, *stolida*, fig. 2, Japan, LEECH, p. 509, P. Z. S. 1889; *H. lubrica*, Dharmasala, BUTLER, p. 60, pl. cxxviii, fig. 9, Ill. Lep. Het. vii; *H. mnioclora*, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 469; *H. tozaridii*, Mexico, pl. xxvii, fig. 25, *differeus*, Panama, fig. 26, DRUCE, p. 294, Biol. Centr. Am. Heter. : n. spp.

Pseudohadena, n. g., for *Hadenis*? *armata*, Alph., which is figured, pl. vii, fig. 5; ALPHÉRAKY, Rom. Mem. v.

Hadula, n. g., p. 43, for *H. insolita*, n. sp., Central Asia, p. 44; STAUDINGER, S. E. Z. 1.

Rhiza, n. g., for *R. commoda*, p. 44, and *R.*? *curva*, p. 46, n. spp., Central Asia; STAUDINGER, S. E. Z. 1.

Karana similis, Dharmasala, BUTLER, p. 60, pl. cxxviii, fig. 8, Ill. Lep. Het. vii, n. sp.



Oligia, revision of the N. American species ; SMITH, Ent. Am. v, pp. 145-152.

Pseudanarta, revision of the N. American species ; SMITH, Ent. Am. v, pp. 175-179.

Isochlora viridis var. *maxima*, Stgr., figured, pl. viii, figs. 9 & 9a ; CHRISTOPH, Rom. Mem. v.

Subæra lucina, Mexico, DRUCE, p. 296, pl. xxvii, fig. 27, Biol. Centr. Am. Heter., n. sp.

Xylina ingrica, synonymical note ; LEECH, P. Z. S. 1889, p. 537.

X. saxeæ, Japan, LEECH, P. Z. S. 1889, p. 537 ; *X. esula*, pl. xxviii, fig. 1, *lytæa*, fig. 2, Mexico, DRUCE, p. 297, Biol. Centr. Am. Heter. : n. spp.

Pulcheria catomelas, described at length, p. 173, figured, pl. vii, figs. 10, a, b ; ALPHÉRAKY, Rom. Mem. v.

Culocampus drucei, Loja, DOGNIN, Le Nat. 1889, p. 67, n. sp.

Cucullia amota, Alph., described at length, p. 177, figured, pl. vii, fig. 11, ALPHÉRAKY, Rom. Mem. v.

C. generosa, Central Asia, STAUDINGER, S. E. Z. 1, p. 51 ; *C. phorylides*, Mexico, DRUCE, p. 298, pl. xxviii, fig. 3, Biol. Centr. Am. Heter. : n. spp.

Rhabinopteryx, n. g., p. 33, for *Ligia turanica*, Ersch., which is described, p. 34, and figured, pl. ii, fig. 6, as *Ischnopteryx turanica* ; CHRISTOPH, Rom. Mem. v.

Rhabinopteryx turanica, Chr., descriptive note ; STAUDINGER, pp. 49 & 60, S. E. Z. 1.

Aedophron venosa, Achal Tekke, CHRISTOPH, Rom. Mem. v, p. 38, pl. ii, fig. 9, n. sp.

Dacira forreri, Mexico, DRUCE, p. 309, pl. xxviii, fig. 27, Biol. Centr. Am. Heter. ; *D. oleaginea*, Loja, DOGNIN, Le Nat. 1889, p. 134 : n. spp.

Omia viola, Stgr., figured ; Rom. Mem. v, pl. ii, fig. 8.

Chloridea rhezia injuring tobacco ; RILEY & HOWARD, Ina. Life, i, p. 228.

Anthæcia emessa, Guatemala, pl. xxviii, fig. 4, p. 309, *scira*, Mexico, fig. 5, p. 301, DRUCE, Biol. Centr. Am. Heter., n. spp.

Adisura imitata, Costa Rica and W. Africa, DRUCE, p. 301, pl. xxviii, fig. 6, Biol. Centr. Am. Heter., n. sp.

Agrophila cleta, pl. xxviii, fig. 7, p. 302, *phænna*, fig. 8, p. 303, Mexico, DRUCE, Biol. Centr. Am. Heter., n. spp.

Metoponia demo, pl. xxviii, fig. 9, *primulina*, fig. 10, p. 303, *M. (?) procida*, fig. 11, p. 304, Mexico, DRUCE, Biol. Centr. Am. Heter., n. spp.

Eugraphia effusa, Panama, DRUCE, p. 304, pl. xxviii, fig. 12, Biol. Centr. Am. Heter., n. sp.

Xanthodes laverna, Centr. America, pl. xxviii, fig. 13, p. 304, *malacha*, Mexico, fig. 14, *X. (?) paulina*, Panama and Ecuador, fig. 15, p. 305, DRUCE, Biol. Centr. Am. Heter., n. spp.

Leocyma nigrilinea, Japan, LEECH, P. Z. S. 1889, p. 522, pl. li, fig. 8, n. sp.

Canna splendens, Moore, figured, pl. cxxviii, fig. 4 ; BUTLER, Ill. Lep. Het. vii.

Miaromima, n. g., near *Acontia*, for *M. dinotis*, n. sp., New Guinea; MEYRICK, Tr. E. Soc. 1889, p. 471.

Acontia lucida, n. var. *lugens*; ALPHÉRAKY, Rom. Mem. v, p. 182.

A. pulchella, Japan, LEECH, P. Z. S. 1889, p. 524, pl. lii, fig. 10; *A. karachiensis*, E. India, SWINHOE, P. Z. S. 1889, p. 410; *A. bicolora*, Kiukiang, LEECH, Tr. E. Soc. 1889, p. 133, pl. ix, figs. 7 & 7a; *A. plebeia*, pl. cxxix, fig. 3, *plumbata*, fig. 4, *excisa*, figs. 5 & 6, p. 61, *picata*, fig. 2, p. 62, *tegulata*, fig. 1, p. 63, Dharmasala, BUTLER, Ill. Lep. Het. vii; *A. phocolisca*, pl. xxviii, fig. 16, *embolina*, fig. 17, p. 306, *apela*, fig. 18, *philomela*, fig. 19, *phya*, fig. 20, *valena*, fig. 21, p. 307, *phænna*, fig. 22, Mexico, *A. (?) damia*, fig. 24, Guatemala, *A. dacia*, Centr. America, fig. 25, p. 308, *cratina*, fig. 26, Mexico, p. 309, DRUCE, Biol. Centr. Am. Heter. : n. spp.

Erastria scitula, habits; PERAGALLO, Bull. Soc. Ent. Fr. (6) ix, p. clxii.

E. flavipunctata, p. 524, pl. liii, fig. 3, *flavicollis*, fig. 4, p. 525, Japan, LEECH, P. Z. S. 1889; *E. olivacea*, pl. liii, fig. 1, p. 526, *brunnea*, fig. 2, *rosacea*, fig. 9, *squalida*, pl. lii, fig. 9, p. 527, Japan, LEECH, P. Z. S. 1889; *E. unduligera*, Dharmasala, BUTLER, p. 63, pl. cxxix, fig. 9, Ill. Lep. Het. vii; *E. amazonia*, Rio Jutahi, WARREN, Tr. E. Soc. 1889, p. 229 : n. spp.

Bankia obliqua, Dharmasala, BUTLER, p. 63, pl. cxxix, fig. 7, Ill. Lep. Het. vii, n. sp.

Hydrelia auripalpis, pl. cxxix, fig. 8, *opalescens*, fig. 10, Dharmasala, BUTLER, p. 64, Ill. Lep. Het. vii, n. spp.

Metachrostis contingens, Moore, referred to *Leptosia*, p. 65, figured, pl. cxxix, fig. 13; BUTLER, Ill. Lep. Het. vii.

Drobeta tiresias, Guatemala, pl. xxix, fig. 1, *ithaca*, Panama, fig. 2, DRUCE, p. 310, Biol. Centr. Am. Heter., n. spp.

Pseudina cossia, Mexico, DRUCE, p. 311, pl. xxviii, fig. 28, Biol. Centr. Am. Heter., n. sp.

Eustrotia cakea, Guatemala, pl. xxix, fig. 3, p. 311, *glycera*, fig. 4, *girba*, fig. 7, *fausta*, fig. 8, Panama, *catilina*, fig. 5, *numa*, fig. 6, p. 312, *catima*, fig. 9, *geta*, fig. 10, *gilda*, fig. 11, *fannia*, fig. 12, *catuda*, fig. 13, p. 313, Mexico, DRUCE, Biol. Centr. Am. Heter., n. spp.

Thalpochares roseana, Moore, figured, pl. cxxx, fig. 3, BUTLER, Ill. Lep. Het. vii. *T. chlorotica* var. *viridis*, Stgr., figured, pl. viii, fig. 11; Rom. Mem. v. *T. polygramma*, Dup., n. var. *pudorina*; STAUDINGER, S. E. Z. I, p. 53.

T. epigramma, p. 53, *leucanides*, p. 55, Centr. Asia, STAUDINGER, S. E. Z. I; *T. argentifrons*, pl. cxxx, fig. 1, *hypenoides*, fig. 2, p. 65, E. India, BUTLER, Ill. Lep. Het. vii; *T. harudes*, pl. xxix, fig. 14, Centr. and S. America and Antilles, *ilicra*, fig. 15, *hirasa*, fig. 16, p. 314, *hippotes*, fig. 17, Mexico, *bias*, fig. 18, *hippotamada*, fig. 19, Guatemala, p. 315, DRUCE, Biol. Centr. Am. Heter. : n. spp.

Anthophila: cf. *Pyralis trilatula*.

Pradatta bimaculata, Moore, pl. cxxix, fig. 12, *beatrice*, pl. cxxx, fig. 6, *artaxoides*, fig. 8, *decorata*, fig. 11, figured; BUTLER, Ill. Lep. Het. vii.

Mumulia tosta, Moore, figured, pl. cxxx, fig. 7; BUTLER, Ill. Lep. Het. vii.

Curubasa cruentata, Moore, figured, pl. cxxx, fig. 9 ; BUTLER, Ill. Lep. Het. vii.

Hircoda dosaroides, Moore, figured, pl. cxxx, fig. 10 ; BUTLER, Ill. Lep. Het. vii.

Ozarba venuta, pl. cxxx, fig. 12, *incondita*, fig. 13, p. 69, Dharmasala, BUTLER, Ill. Lep. Het. vii, n. spp.

Palindia regina, Ecuador, DRUCE, p. 93, Ann. N. H. (6) iv ; *P. mustela*, pl. xxix, fig. 21, Mexico, p. 318, *micca*, Panama and Colombia, fig. 22, p. 319, *dera*, Centr. America, fig. 23, p. 320, DRUCE, Biol. Centr. Am. Heter. : n. spp.

Chulydis hemitheia, Panama, DRUCE, p. 316, pl. xxix, fig. 20, Biol. Centr. Am. Heter., n. sp.

Homodes iomolybda, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 477, n. sp.

Ceparcha, n. g., for *C. cymatistis*, n. sp., New Guinea ; MEYRICK, Tr. E. Soc. 1889, p. 476.

Dyomyx lineata, Centr. and S. America, DRUCE, p. 320, pl. xxix, figs. 24 & 25, Biol. Centr. Am. Heter., n. sp.

Dyops juba, pl. xxix, fig. 6, p. 321, *phila*, fig. 27, *minthe*, fig. 28, Panama, p. 322, DRUCE, Biol. Centr. Am. Heter., n. spp.

Litoprosopus hatuey, Poey, = (*configens*, Walk., and ? *futilis*, G. & B.) ; DRUCE, p. 322, Biol. Centr. Am. Heter.

Callopietria minuta, Dharmasala, BUTLER, p. 70, pl. cxxx, fig. 4, Ill. Lep. Het. vii ; *C. mexicana*, pl. xxx, fig. 1, p. 323, *panamensis*, fig. 2, p. 324, Centr. America, DRUCE, Biol. Centr. Am. Heter., n. spp.

Penicillaria, note on the composition of ; BUTLER, p. 70, Ill. Lep. Het. vii. *P. abscondens*, Walk., figured, pl. xxx, fig. 3 ; Biol. Centr. Am. Heter.

P. maculata, Dharmasala, BUTLER, p. 71, pl. cxxx, fig. 5, Ill. Lep. Het. vii, n. sp.

Dysodia sica, pl. xxx, fig. 4, *lineata*, fig. 7, Mexico, *nipsa*, fig. 5, *lusia*, fig. 6, Panama, DRUCE, p. 325, Biol. Centr. Am. Heter., n. spp.

Ingura, Guén., = (*orthoclostera*, Butl.) ; DRUCE, p. 326, Biol. Centr. Am. Heter.

I. murina, Centr. and S. America, DRUCE, pl. xxx, fig. 8, p. 326, Biol. Centr. Am. Heter., n. sp.

Mentleta albicostalis, China, pl. ii, fig. 10, *luteofascialis*, fig. 15, Japan, LEECH, p. 65, Ent. xxii, n. spp.

Abrotolu adrana, Mexico, DRUCE, p. 327, pl. xxx, fig. 9, Biol. Centr. Am. Heter., n. sp.

Plusia c-aureum, Kn., = (*mikadina*, Butl.), p. 531 ; *jessica*, Butl., = (*serena*, Butl.), p. 532 ; *ornatissima*, Wlk., = (*locuples*, Oberth.), p. 533 ; LEECH, P. Z. S. 1889. *P. aurifera* and *P. illustris*, old British examples of ; BARRETT, Ent. M. M. xxv, p. 223 ; DALE, t. c. p. 246. *P. gamma*, abdominal gland of larva ; SCHÄFFER, Zool. Jahrb. Anat. Abth. iii, pp. 623-626.

P. festata, p. 262, *fumifera*, p. 263, Amurland, GRAESER, B. E. Z. xxxiii ; *P. bella*, Achal Tekke, CHRISTOPH, Rom. Mem. v, p. 36, pl. ii, fig. 7 ; *P. hebetata*, N. India, BUTLER, p. 71, pl. cxxxi, fig. 1, Ill. Lep. Het. vii ;

P. arizona, lenzii, N. America, FRENCH, Canad. Ent. xxi, p. 161; *P. coronides*, pl. xxx, fig. 10, p. 328, *smithi*, fig. 12, *acantha*, fig. 13, Mexico, *ariandla*, Arizona and Sonora, p. 329, *acema*, fig. 14, *P. (?) asgyra*, fig. 15, p. 330, Mexico, *abeona*, fig. 16, Panama and Cuba, *longicornis*, fig. 17, Panama and Ecuador, p. 332, *abrola*, Mexico, fig. 19, p. 333, DRUCE, Biol. Centr. Am. Heter. : n. spp.

Risoba sphaerophora, N. Guinea, MEYRICK, Tr. E. Soc. 1889, p. 472, n. sp.

Thyrsozelis, n. g. (*Plusiada*), for *T. iridias*, n. sp., New Guinea; MEYRICK, Tr. E. Soc. 1889, p. 473.

Calpe capucina, Esp., = (*sodalis*, Butl.) ; LEECH, P. Z. S. 1889, p. 529.

C. aureola, Amurland, GRAESER, B. E. Z. xxxiii, p. 260, n. sp.

Hemiceras ruizi, punctata, Ecuador, DOGNIN, Le Nat. 1889, p. 25, n. spp.

Diamuna longipes, pl. xxx, fig. 18, *adrasta*, fig. 20, Mexico, *cedessa*, figs. 21 & 22, Guatemala, *alia*, figs. 23 & 24, Panama, DRUCE, p. 334, Biol. Centr. Am. Heter., n. spp.

Hypsoropha adeona, Mexico, DRUCE, p. 333, pl. xxx, fig. 28, Biol. Centr. Am. Heter., n. sp.

Barydia severa, Panama and Guiana, DRUCE, p. 340, pl. xxx, fig. 27, Biol. Centr. Am. Heter., n. sp.

Phaocyma ilia, Panama, DRUCE, p. 340, pl. xxxi, fig. 1, Biol. Centr. Am. Heter., n. sp.

Anomis figlina, p. 71, pl. cxxxi, fig. 2, *ocellata*, p. 72, & fig. 4, Dharmasala, BUTLER, Ill. Lep. Het. vii; *A. aricina*, Panama, DRUCE, p. 337, pl. xxx, fig. 26, Biol. Centr. Am. Heter. : n. spp.

Panilla apicalis, Dharmasala, BUTLER, p. 74, pl. cxxxii, fig. 1, Ill. Lep. Het. vii., n. sp.

Piada multiplicans n. var. *japonica*; LEECH, p. 538, pl. lii, fig. 6, P. Z. S. 1889.

Amphipyra pyramidea = (*monolitha*, Gn., *magna*, Wlk., *obscura*, Oberth.); LEECH, p. 135, Tr. E. Soc. 1889. *A. perflua*, Fab., varr. = (*orebina*, Butl., & *jankowskii*, Oberth.); LEECH, p. 540, P. Z. S. 1889.

Dinumma, Wlk., = (*Ortheaga*, Wlk.); BUTLER, p. 73, Ill. Lep. Het. vii. *D. varians*, Dharmasala, BUTLER, p. 73, pl. cxxxi, figs. 9 & 10, Ill. Lep. Het. vii, n. sp.

Eliochreia opulenta, p. 73, pl. cxxxi, figs. 5 & 6, *curtipalpis*, p. 74, & figs. 7 & 8, Dharmasala, BUTLER, Ill. Lep. Het. vii, n. spp.

Spintherops cataphanes, var. *maculifera*, Stgr., figured, pl. viii, fig. 8, Rom. Mem. v.

Autophilu dilucida, Hb., = (*Appopestes inconspicua*, Butl.); LEECH, P. Z. S. 1889, p. 541.

Pantlesma terrigena, Chr., figured, Rom. Mem. v, pl. ii, fig. 11.

P. jubra, Rangoon, SWINHOE, P. Z. S. 1889, p. 413, pl. xlv, fig. 4, n. sp.

Homoptera lunata, habits of larva; LINTNER, Fourth Rep. pp. 57-59.

H. amona, Centr. America, DRUCE, pl. xxxi, fig. 3, p. 344, Biol. Centr. Am. Heter., n. sp.

Praxis quadrata, Masauary, MABILLE, Le Nat. 1889, p. 25, n. sp.



Briarda cervina, Wlk., referred to *Anomis*, p. 72, and n. var. *instabilis*, figured, pl. cxxxi, fig. 3; BUTLER, Ill. Lep. Het. vii.

Catephia flavescens, Dharmasala; BUTLER, p. 74, pl. cxxxi, fig. 12, Ill. Lep. Het. vii, n. sp.

Anophia mosara, E. India, SWINHOE, P. Z. S. 1889, p. 413, n. sp.

Erygia, Guen., = (*Calicula*, Wlk.); BUTLER, p. 75, Ill. Lep. Het. vii.

E. apicalis, = (*Calicula squamipennis* and *Dianthecia geometroides*, Wlk.); BUTLER, l. c.

E. sigillata, Dharmasala, BUTLER, p. 75, pl. cxxxi, fig. 11, Ill. Lep. Het. vii, n. sp.

Leucanitis obscurata, Stgr., figured, pl. viii, fig. 6, Rom. Mem. v. *L. tenera*, n. var. *antiqua*; STAUDINGER, S. E. Z. I, p. 56.

Palpangula imitatrix, Achal Tekke, CHRISTOPH, Rom. Mem. v, p. 42, pl. iii, fig. 1, n. sp.

Hypocala subsatura, n. var. *limbata*; BUTLER, p. 76, p. cxxxi, fig. 13, Ill. Lep. Het. vii.

Catocala fraxini, L., var. described; FUCHS, JB. nass. Ver. xlii, p. 210.

C. lupina, H. S., larva described; STRECKFUSS, B. E. Z. xxxiii, p. 310.

C. electa, Borkh., = (*salmunna*, Butl.), *bella*, Butl., = (*serenides*, Staud.), p. 550, *conneza*, Butl., = (*nubila*, Butl.), *paranympa*, L., = (*xarippe*, Butl.), p. 552; LEECH, P. Z. S. 1889. *C. sponsa*, habit of young larva; DÖNITZ, B. E. Z. xxxiii, p. 8, S.B.

C. lesbia, Achal Tekke, CHRISTOPH, Rom. Mem. v, p. 44, pl. iii, figs. 2, a & b; *C. juncta*, Central Asia, STAUDINGER, S. E. Z. I, p. 59; *C. mabella*, Japan, HOLLAND, Tr. Am. Ent. Soc. xvi, p. 75; *C. intacta*, pl. liii, fig. 7, p. 548, Japan, *puella*, fig. 5, p. 551, Corea, *separans*, fig. 6, p. 552, Japan, LEECH, P. Z. S. 1889; *C. inconstans*, p. 76, pl. cxxxii, figs. 2 & 3, *distorta*, fig. 4 & p. 77, Dharmasala, BUTLER, Ill. Lep. Het. vii: n. spp.

Chrysorithum amatum, Br., varietal note, = (*fuscum* and *rufescens*, Butl.); LEECH, P. Z. S. 1889, p. 547.

Phyllodes meyricki, Queensland, OLLIFF, P. Linn. Soc. N.S.W. (2) iv, p. 114, woodcut, n. sp.

Sypna picta, Butl., = (*achatina*, *fumosana*, *fuliginosa*, *moorei*, Butl.); LEECH, P. Z. S. 1889, p. 542. *Sypna*, cf. *Gisira hercules*, *Deltoidæ*.

S. watanabii, Japan, HOLLAND, Tr. Am. Ent. Soc. xvi, p. 76; *S. distincta*, Kiukiang, LEECH, p. 136, pl. ix, fig. 10, Tr. E. Soc. 1889: n. spp.

Spirama retorta, Cl., variation noticed, = (*suffusama*, *japonica*, *retorta*, Gn., *simplicior*, *inaequalis*, *jinchuena*, *funestris*, Butl.); LEECH, P. Z. S. 1889, p. 545. *S. martha*, Butl., = (*agrotæ*, Butl.); LEECH, p. 139, Tr. E. Soc. 1889.

S. confusa, pl. cxxxii, figs. 6-8, *rosacea*, figs. 9 & 10, Dharmasala, BUTLER, p. 78, Ill. Lep. Het. vii, n. spp.

Platyja nubiferæ, Japan, LEECH, p. 64, pl. ii, fig. 8, Ent. xxii, n. sp.

Pseudophia sublunaris, with var. ? *delunaris*, Central Asia, STAUDINGER, S. E. Z. I, p. 56, n. sp.

Naxia coreana, Gensan, LEECH, P. Z. S. 1889, p. 560, pl. lii, fig. 11, n. sp.

Ophiura algira n. var. *curcata*, LEECH, p. 546, pl. liii, fig. 8, P. Z. S. 1889.

- O. triangulata*, E. India, SWINHÖE, P. Z. S. 1889, p. 414, n. sp.
Trigonodes cuneigera, Kangra, BUTLER, p. 79, pl. cxxxii, fig. 5, Ill. Lep. Het. vii, n. sp.
Sarothroceras, n. g., near *Trigonodes*, for *S. alluaudi*, n. sp., Africa; MABILLE, Bull. Soc. Ent. Fr. (6) ix, p. xeix.
Euclidia regia, Stgr., pl. viii, fig. 1, *catocalis*, Stgr., var., fig. 2, figured; Rom. Mem. v.
E. captata, Kangra, BUTLER, p. 79, pl. cxxxiii, fig. 1, Ill. Lep. Het. vii, n. sp.
Raparna undulata, Moore, ♀, = (*Asthenes querula*, Swinh.), p. 80, figured, pl. cxxxiii, fig. 2; BUTLER, Ill. Lep. Het. vii.
R. usta, Dharmasala, BUTLER, p. 80, pl. cxxxiii, fig. 3, Ill. Lep. Het. vii, n. sp.
Remigia nigrisigna, Japan, LEECH, P. Z. S. 1889, p. 553, pl. lii, fig. 5, n. sp.
Isogona inferior, Amazons, WARREN, Tr. E. Soc. 1889, p. 229, n. sp.
Panopoda rufimargo var. *rosicosta*, Gn., larva described; SOULE & ELIOT, Psyche, v, p. 259.
Thyridospila virgata, Simla, SWINHÖE, P. Z. S. 1889, p. 415, n. sp.
Harmatelia bifidialis, Hakodate, LEECH, p. 64, pl. ii, fig. 11, Ent. xxii, n. spp.
Pericyma profesta, Achal Tekke, CHRISTOPH, Rom. Mem. v, p. 39, pl. ii, figs. 10a & b, n. sp.
Episparsis sora (Moore, i.l.), Assam, SWINHÖE, P. Z. S. 1889, p. 415, n. sp.
Darata glaucescens, pl. cxxxiii, fig. 4, *lilacina*, fig. 5, Dharmasala, BUTLER, Ill. Lep. Het. vii, n. spp.
Gathynia simulans, Kangra, BUTLER, p. 81, pl. cxxxiii, figs. 6 & 7, Ill. Lep. Het. vii, n. sp.
Azasia: the components of the genus; SNELLEN, Tijdschr. Ent. xxxii, p. 2. *A. ussuriensis*, Br., = (*unduligera*, Butl.); LEECH, P. Z. S. 1889, p. 553.
A. henrici, Sumatra, SNELLEN, Tijdschr. Ent. xxxii, p. 2, pl. i, fig. 1, n. sp.
Dagassa marginata, Amazons, WARREN, Tr. E. Soc. 1889, p. 230, n. sp.
Capnodes gensanalis, Corea, LEECH, p. 63, pl. ii, fig. 9, Ent. xxii, n. sp.
Clypana mesogramma, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 478, n. sp.
Chadaca, Walk., redescribed, queried as distinct from *Ricula*; WARREN, Tr. E. Soc. 1889, p. 233.
Chadaca modesta, *concatenalis*, Amazons, WARREN, Tr. E. Soc. 1889, p. 234, n. spp.
Symmerista marcato, Loja, DOGNIN, Le Nat. 1889, p. 82, n. sp.
Orudiza, n. sp., cf. *Geometridæ*.

DELTOIDÆ.

[Cf. BUTLER (113, 116), LEECH (485, 487), MEYRICK (567), SMITH (829), SWINHÖE (852), WARREN (896).]

Leg structure in N. American genera; SMITH, Ent. Am. v, pp. 107-111, pl. ii.

Zanclognatha linealis, Japan, pl. ii, fig. 4, *obliquialis*, Foochau, fig. 5, LEECH, p. 63, Ent. xxii, n. spp.

Calobochyla bilinealis, China, LEECH, pl. ii, fig. 14, p. 64, Ent. xxii, n. sp.

Sarmatia dirisalis, Wlk., = (*Bertula subcupralis*, Wlk.), and is referred to *Rhesena*; WARREN, Tr. E. Soc. 1889, p. 245.

Rhynchina eremialis, E. India, SWINHOE, P. Z. S. 1889, p. 417; *E. plusioides*, p. 82, pl. cxxxiii, fig. 9, *sagittata*, figs. 10 & 11, *cærulescens*, fig. 12, p. 83, *uniformis*, fig. 13, *rivuligera*, fig. 14, *angustata*, fig. 15, p. 84, Dharmasala, BUTLER, Ill. Lep. Het. vii : n. spp.

Hypena abrasalis, *illapsalis*, Wlk., referred to *Tamyra*, H. S.; WARREN, Tr. E. Soc. 1889, p. 238.

H. albopunctalis, Corea, p. 557, pl. lii, fig. 10, *similalis*, Japan, p. 558, pl. lii, fig. 2, LEECH, P. Z. S. 1889; *H. corealis*, Gensan, pl. ii, fig. 1, *subsumalis*, fig. 13, p. 62, *rusticalis*, fig. 12, p. 63, Japan, LEECH, Ent. xxii; *H. herbigrada*, *radicalis*, E. India, SWINHOE, P. Z. S. 1889, p. 416; *H. crassipalpis*, pl. cxxxiii, fig. 16, *ceronica*, fig. 17, p. 85, *biplagiata*, pl. cxxxiv, fig. 1, *urticicola*, fig. 2, p. 86, Dharmasala, BUTLER, Ill. Lep. Het. vii; *H. isogona*, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 478; *H. munda*, p. 230, *fuscipennis*, p. 231, Amazons, WARREN, Tr. E. Soc. 1889 : n. spp.

Hyphypena, n. g., p. 231, for *H. bipunctalis*, n. sp., Amazons, p. 232; WARREN, Tr. E. Soc. 1889.

Harmatelia, n. sp.; cf. *Noctuidæ*.

Platyja, n. sp.; cf. *Noctuidæ*.

Acrarmostis, n. g., next *Britha*, for *A. dryopa*, n. sp., New Guinea; MEYRICK, Tr. E. Soc. 1889, p. 479.

Alinzia inconspicua, Butl., referred to *Rivula*; WARREN, Tr. E. Soc. 1889, p. 233.

Hypenodes balnearum, Alph., figured, pl. xii, fig. 3, Rom. Mem. v.

Gisira hercules, Butl., referred to *Sypna*; LEECH, P. Z. S. 1889, p. 543.

Hyamia palpitatalis, Wlk., referred to *Rivula*; WARREN, Tr. E. Soc. 1889, p. 233.

Lametia ignitalis, Wlk., referred to *Tamyra*, H.-S.; WARREN, Tr. E. Soc. 1889, p. 237.

Paramimetica, n. g. (*Hypenidæ*), p. 235, for *P. subrufa*, p. 235, *imitatrix*, p. 236, n. spp., Amazons, and *Hypena solinsalis*, and *Megatomis* (?) *judicatialis*, Wlk.; WARREN, Tr. E. Soc. 1889.

Paramarna, n. g., p. 237, for *Phalæna-Geometra arnea*, Cram.; WARREN, Tr. E. Soc. 1889.

Azamorida, n. fam., for *Azamora*, Wlk., and other genera, with pouch near base of forewings of ♂; WARREN, Tr. E. Soc. 1889, p. 238.

Aginus levicula, Simla, SWINHOE, P. Z. S. 1889, p. 417, n. sp.

Chadaca, Walk.; cf. *Noctuidæ*.

Herminia fascialis, Hakodate, pl. ii, fig. 3, *ningpoalis*, China, fig. 7, LEECH, p. 64, Ent. xxii; *H. palumbina*, Dharmasala, BUTLER, p. 88, pl. cxxxiv, fig. 9, Ill. Lep. Het. vii : n. spp.

Erebothrix, n. g. (*Herminiidae*), p. 241, for *E. seminata*, n. sp., Amazons, p. 242 ; WARREN, Tr. E. Soc. 1889.

Physulodes, n. g., for *Physula eupithecialis*, Gn. ; WARREN, p. 242, Tr. E. Soc. 1889.

Parachabora, n. g., for *Noctua abydas*, H.-S. ; WARREN, p. 245, Tr. E. Soc. 1889.

Bleptina incultalis, Japan, LEECH, P. Z. S. 1889, p. 564, pl. liii, fig. 11 ; *B. dubia*, Dharmasala, BUTLER, p. 89, pl. cxxxiv, fig. 4, Ill. Lep. Het. vii ; *B. albidiscalis*, p. 239, *prunescens*, *olivescens*, p. 240, Amazons, WARREN, Tr. E. Soc. 1889 : n. spp.

Meranda tristalis, Japan, LEECH, p. 65, pl. ii, fig. 6, Ent. xxii, n. sp.

Tortricodes alucitalis, Gn., redescribed ; WARREN, p. 254, Tr. E. Soc. 1889.

Episeuzis saccharivora, pl. cxxxiv, fig. 7, *maculifera*, fig. 8, p. 87, Dharmasala, BUTLER, Ill. Lep. Het. vii ; *E. marginata*, Amazons, WARREN, Tr. E. Soc. 1889, p. 234 : n. spp.

Megatomis bidentalis, Amazons, WARREN, Tr. E. Soc. 1889, p. 243, n. sp.

Mastigophorus mirabilis, Jamaica, BUTLER, p. 359, woodcut, Ann. N. H. (6) iii, n. sp.

Bertula biciliata, Amazons, WARREN, Tr. E. Soc. 1889, p. 241, n. sp.

Hypoepa bambusalis, Foochau, LEECH, p. 63, pl. ii, fig. 2, Ent. xxii, n. sp.

Egnasia argillacea and *fallax*, Butl., referred to *Rivula* ; WARREN, Tr. E. Soc. 1889, p. 233.

E. cinerea, Dharmasala, BUTLER, p. 89, pl. cxxxv, fig. 1, Ill. Lep. Het. vii ; *E. (?) albipunctata*, Amazons, WARREN, Tr. E. Soc. 1889, p. 247 : n. spp.

Saraca indentalis, pl. iii, fig. 4, *textilis*, fig. 12, Japan and Corea, LEECH, p. 567, P. Z. S. 1889, n. spp.

Rhododactyla, n. g. (*Herminiidae*), for *Calobochyla (?) elierina*, Feld. ; WARREN, p. 248, Tr. E. Soc. 1889.

Dysglyptogona, n. g., p. 248, for *D. dissimilis*, n. sp., Amazons, p. 249 ; WARREN, Tr. E. Soc. 1889.

Erebostrota, n. g., p. 250, for *E. albocincta*, n. sp., Amazons, p. 251 ; WARREN, Tr. E. Soc. 1889.

Triommatodes, n. g., p. 251, for *T. plumosa*, n. sp., Amazons, p. 252 ; WARREN, Tr. E. Soc. 1889.

Atopomorpha, n. g., p. 252, for *A. singularis*, n. sp., Amazons, p. 253 ; WARREN, Tr. E. Soc. 1889.

Pseudaglossa fulvipicta, p. 87, pl. cxxxiv, fig. 5, *atrata*, p. 88 & fig. 6, Dharmasala, BUTLER, Ill. Lep. Het. vii, n. spp.

Ecregma damatesalis, Wlk., = (*Glymphis eraconalis*, Wlk.), referred to *Rivula* ; WARREN, Tr. E. Soc. 1889, p. 233.

Pteropristida, n. fam. proposed for *Tortricodes*, Gn., *Gaberasa*, Wlk., and *Pteroprista* ; WARREN, Tr. E. Soc. 1889, p. 254.

Pteroprista, n. g., p. 256, for *P. metallica*, n. sp., Amazons, p. 257 ; WARREN, Tr. E. Soc. 1889.

GEOMETRIDÆ.

[Cf. ALPHÉRAKY (748), BLACHIER (72), BUTLER (113), CHRISTOPH (748), DOGNIN (193), GRAESER (330), HUDSON (409), JACOBI (413), LEECH (484), MEYRICK (567), POPPIUS (644), SNELLEN (834), SWINHOE (852), WACKERZAPP (885), YAKOBIYA (946).]

Dendrometrída : descriptions of the Finland species, with plates of wing-neuration ; POPPIUS (644).

Urapteryx margaritata, Moore, figured ; WATERHOUSE, Aid, pl. 184, fig. 1.

U. excellens, Cashmiera, BUTLER, p. 99, pl. cxxxv, fig. 13, Ill. Lep. Het. vii, n. sp.

Cyclidia substigmaria, Hb., systematic position discussed ; SNELLEN, Tijdschr. Ent. xxxii, pp. 5-8.

Drepanodes arcuata, Wlk., larva described ; BEUTENMÜLLER, Ent. Am. v, p. 38.

Hetrione, n. g., for *H. advenaria*, Hb. ; POPPIUS, Act. Soc. Faun. and Flor. Fenn. iii, No. 3, p. 56.

Venilia maculata, varr. noticed ; OBERTHUR, Bull. Soc. Ent. Fr. (6) ix, p. lxxxiii.

Tetracis indica, Dharmasala, BUTLER, p. 99, pl. cxxxv, fig. 16, Ill. Lep. Het. vii, n. sp.

Pseudomiza, n. g., for several known species, and *P. argillacea*, n. sp., Dharmasala, pl. cxxxv, fig. 15 ; BUTLER, p. 100, Ill. Lep. Het. vii.

Corymica vitrigera, Dharmasala, BUTLER, p. 101, pl. cxxxv, fig. 14, Ill. Lep. Het. vii, n. sp.

Hypephyra, n. g., for *H. terrosa*, n. sp., Dharmasala, pl. cxxxv, fig. 17 ; BUTLER, p. 101, Ill. Lep. Het. vii.

Abaciscus, n. g., for *A. tristis*, n. sp., Dharmasala, pl. cxxxv, fig. 18 ; BUTLER, p. 102, Ill. Lep. Het. vii.

Hygrochroa ojeda, Laja, DOGNIN, Le Nat. 1889, p. 58, n. sp.

Selenia illunaria and *illustraria*, experiments in breeding of ; MERRIFIELD (562).

Azelina incisa, Ecuador ?, DOGNIN, Le Nat. 1889, p. 67, n. sp.

Odontopera bidentata, food-plant ; MITCHELL, Ent. xxii, p. 73.

Odontoptera mandarinata, Kiukiang, LEECH, p. 141, pl. ix, fig. 13, Tr. E. Soc. 1889, n. sp.

Crocallis bilinsaria, E. India, SWINHOE, P. Z. S. 1889, p. 423, n. sp.

Spica, n. g., near *Colotois*, for *S. luteola*, n. sp., Sikkim, pl. xlv, fig. 10 ; SWINHOE, p. 424, P. Z. S. 1889.

Ennomos viridata, Moore, figured ; WATERHOUSE, Aid, pl. 184, fig. 4. *E. chilunaria*, Blanch., (= *hyadesi*, Mab.) ; BERG, p. cxxli, Bull. Soc. Ent. Fr. (6) ix.

Eugonia, distinctive characters of species of ; DÖNITZ, B. E. Z. xxxiii, p. 5, S.B.

Omiza militaria, Nilgiri Hills, SWINHOE, P. Z. S. 1889, p. 425, n. sp.

Monocteniadæ, n. n., to replace *Enochromidæ* ; *Monoctenia*, = (*Enochroma*, Gn.) ; MEYRICK, Tr. E. Soc. 1889, p. 481.

Nyssia zonaria, food-plant ; NEWSTEAD, Ent. xxii, p. 187.

Biston lapponarius, larva noticed ; HABICH, S. E. Z. I, p. 350.

Amphidasys betularia, origin of var. of ; THORPE, Ent. xxii, p. 162 : results of pairing between varr. ; ARKLE, Ent. xxii, p. 236.

A. porphyria, Kangra, BUTLER, p. 102, pl. cxxxvi, fig. 1, Ill. Lep. Het. vii, n. sp.

Buzura abrazata, Kiukiang, LEECH, p. 143, pl. ix, fig. 14, Tr. E. Soc. 1889 ; *B. varianaria*, E. India, SWINHOE, P. Z. S. 1889, p. 425 : n. spp.

Hemerophila nychthemeraria, Hb., larva noticed, p. 259, figured, pl. iv, fig. 9 ; BLACHIER, Ann. Soc. Ent. Fr. (6) ix.

H. lederi, Achal Tekke, CHRISTOPH, Rom. Mem. v, p. 48, pl. iii, fig. 4, n. sp.

Tigridoptera cyanozantha, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 497, n. sp.

Narapa breta, Nilgiri Hills, SWINHOE, p. 426, P. Z. S. 1889, n. sp.

Boarmia maoticaria, Alph., figured, pl. xii, figs. 4a & b ; Rom. Mem. v. *B. rhomboidaria*, a food-plant of ; WAINWRIGHT, Ent. M. M. xiv, p. 456.

B. fortunata, Teneriffe, BLACHIER, Ann. Soc. Ent. Fr. (6) ix, p. 255, pl. iv, fig. 1 ; *B. glareosaria*, Amurland, GRAESER, B. E. Z. xxxiii, p. 266 ; *B. ocellata*, Kiukiang, LEECH, p. 143, pl. ix, fig. 11, Tr. E. Soc. 1889 ; *B. callicrossa*, p. 498, *epistictis*, p. 499, New Guinea, MEYRICK, Tr. E. Soc. 1889 : n. spp.

Phelotis, n. g., for *P. xylinopa*, n. sp., New Guinea, and some described species (of *Boarmia* ?) ; MEYRICK, Tr. E. Soc. 1889.

Alcis sublimis, Dharmasala, BUTLER, p. 103, pl. cxxxv, fig. 19, Ill. Lep. Het. vii, n. sp.

Choguda latipennis, Dharmasala, BUTLER, p. 103, pl. cxxxvi, fig. 2, Ill. Lep. Het. vii, n. sp.

Pseudoterpna, Hb., = (*Hypochroma*, Gn.) ; MEYRICK, Tr. E. Soc. 1889, p. 496.

P. diphtherina, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 496, n. sp.

Pachyodes arenaria, Kiukiang, LEECH, p. 144, pl. ix, fig. 12, Tr. E. Soc. 1889, n. sp.

Gnophos dumetata, var. described ; FUCHS, JB. nass. Ver. xlii, p. 221.

Loxochila variegata, Dharmasala, BUTLER, p. 104, pl. cxxxvi, fig. 3, Ill. Lep. Het. vii, n. sp.

Geometra papilionaria, life-history of ; GRAPES, Ent. xxii, pp. 110-112. *G. vernaria*, larva of, mimicry and protection ; WACKERZAPP (885).

Nemoria grandilocaria, Amurland, GRAESER, B. E. Z. xxxiii, p. 266 ; *N. gracilis*, pl. cxxxvi, fig. 4, *gelida*, fig. 5, Dharmasala, BUTLER, p. 104, Ill. Lep. Het. vii ; *N. ioxoma*, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 495 : n. spp.

Comostola, generic characters modified, p. 490 ; *Eucrostis pyrrhogona*, Wlk., *Iodis nereidaria*, Snell., *Amaurinia rubrolimbaria*, Gn., referred to it, pp. 491 & 492 ; MEYRICK, Tr. E. Soc. 1889.

C. conchylus, N. Guinea, MEYRICK, Tr. E. Soc. 1889, p. 490, n. sp.

Iodis neomela, *aphrias*, p. 492, *lithocrossa*, p. 493, New Guinea, MEYRICK, Tr. E. Soc. 1889, n. spp.

Thalassodes unduligera, N. India, BUTLER, p. 105, pl. cxxxvi, fig. 7, Ill. Lep. Het. vii, n. sp.

Eucrostis petitaria, Achal Tekke, CHRISTOPH, Rom. Mem. v, p. 47, pl. iii, fig. 3 : *E. halcyone*, *calliptera*, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 489 : n. spp.

Phorodema tancrei, Amurland, GRAESER, B. E. Z. xxxiii, p. 264, n. sp. *Comibena quadrinotata*, Dharmasala, BUTLER, p. 105, pl. cxxxvi, fig. 7, Ill. Lep. Het. vii, n. sp.

Racheospila striz, Dharmasala, BUTLER, p. 105, pl. cxxxvi, fig. 8, Ill. Lep. Het. vii, n. sp.

Agathia quinaria, Moore, fig. 2, *arcuata*, fig. 3, figured ; WATERHOUSE, Aid, pl. 184.

A. prasinaspis, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 495, n. sp.

Chlororithra, n. g., for *C. fea*, n. sp., Dharmasala, pl. cxxxvi, fig. 9, BUTLER, p. 107, Ill. Lep. Het. vii.

Anisodes annulifera, Dharmasala, Butler, p. 107, pl. cxxxvi, fig. 10, Ill. Lep. Het. vii, n. sp.

Zonosoma albicollaria, Hb., larva described ; STRECKFUSS, B. E. Z. xxxiii, p. 309.

Drapetodes, referred to *Drepanulidæ* ; SNELLEN, Tijdschr. Ent. xxxii, p. 11.

D. nummularia, Java, SNELLEN, Tijdschr. Ent. xxxii, p. 11, pl. i, figs. 4 & 4a, n. sp.

Eois lacteipennis, pl. cxxxvi, fig. 11, *protensa*, fig. 12, Dharmasala, BUTLER, p. 107, Ill. Lep. Het. vii, n. spp.

Pseudasthena cinerea, Dharmasala, BUTLER, p. 108, pl. cxxxvi, fig. 13, Ill. Lep. Het. vii, n. sp.

Acidalia humiliata, Hufn., synonym of ; TUTT, Ent. xxii, pp. 121-125. *A. inornata*, Hw., larva described ; DELAHAYE, Bull. Soc. Ent. Fr. (6) ix, p. cl. *A. bilinearia*, Fuchs, validity of affirmed, metamorphosis ; FUCHS, JB. nass. Ver. xlii, pp. 211-218.

A. guancharia, Teneriffe, ALPHÉRAKY, p. 227, pl. xi, fig. 6, Rom. Mem. v ; *A. parasira*, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 485 : n. spp.

Idea cerussina, p. 108, pl. cxxxvi, fig. 14, *lacernigera*, fig. 15, *insuaria*, fig. 16, p. 109, Dharmasala, BUTLER, Ill. Lep. Het. vii, n. spp.

Crapedia insolata, Dharmasala, BUTLER, p. 109, pl. cxxxvi, fig. 17, Ill. Lep. Het. vii, n. sp.

Mnesterodes, n. g., near *Acidalia*, for *M. trypheropa*, n. sp., New Guinea ; MEYRICK, Tr. E. Soc. 1889, p. 483.

Xenocentris, n. g., near *Acidalia*, for *X. rhipidura*, n. sp., New Guinea ; MEYRICK, Tr. E. Soc. 1889, p. 484.

Prasonesis, n. g., near *Dithalma*, for *P. microphylla*, n. sp., New Guinea ; MEYRICK, Tr. E. Soc. 1889, p. 486.

Perixera syntona, *nephelospila*, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 487, n. spp.

Timandra hemichroa, *molybdias*, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 488, n. spp.

Problepsis vulgaris, Kangra, BUTLER, p. 43, pl. cxv, fig. 2, Ill. Lep. Het. vii, n. sp.

Micronia, note on systematic position ; SNELLEN, Tijdschr. Ent. xiii, p. 398.

Hydata amplipennis, Dharmasala, BUTLER, p. 111, pl. cxxxvi, fig. 18, Ill. Lep. Het. vii, n. sp.

Orudiza columbaris, Dharmasala, BUTLER, p. 82, pl. cxxxiii, fig. 8, Ill. Lep. Het. vii, n. sp.

Ellicrinia nigigera, N. India, BUTLER, p. 112, pl. cxxxvii, fig. 3, Ill. Lep. Het. vii, n. sp.

Macaria isospila, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 501, n. sp.

Gubaria subalbataria, E. India, SWINHOE, P. Z. S. 1889, p. 428, n. sp.

Fidonia piniaria, L., memoir on, in the Russian language ; YAKOBYA (1946): colouration of and phylogeny ; JACOBI (413).

Fidonia? lafayi, riofrio, Ecuador, DOGNIN, Le Nat. 1889, p. 38, n. spp.

Epifidonia absona, Sikkim, SWINHOE, P. Z. S. 1889, p. 427, n. sp.

Tephрина homalodes, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 501, n. sp.

Rhodostrophia, Hüb., = (*Phyletis*, Gn.) ; BUTLER, p. 110, Ill. Lep. Het. vii.

R. stigmatica, pl. cxxxvi, figs. 19 & 20, *tristigalis*, pl. cxxxvii, fig. 1, p. 110, *rara*, fig. 2, p. 111, Dharmasala, BUTLER, Ill. Lep. Het. vii, n. spp.

Phyletis borealis, E. India, SWINHOE, P. Z. S. 1889, p. 427, pl. xlv, fig. 8, n. sp.

Aspilates cruciferaria, Berg, = (*glyphicarius*, Mab.) ; BERG, p. cxli, Bull. Soc. Ent. Fr. (6) ix.

A. hastigera, Dharmasala, BUTLER, p. 112, pl. cxxxvii, figs. 4 & 5, Ill. Lep. Het. vii, n. sp.

Icterodes conspersa, Dharmasala, BUTLER, p. 113, pl. cxxxvii, fig. 6, Ill. Lep. Het. vii, n. sp.

Micrabrazas, n. g., for *M. punctigera*, n. sp., Dharmasala, pl. cxxxvii, fig. 7 ; BUTLER, p. 113, Ill. Lep. Het. vii.

Abraxas grossulariata, varr. noticed ; OBERTHUR, Bull. Soc. Ent. Fr. (6) ix, p. lxxxiv.

A. luteolaria, Nilgiri Hills, p. 430, *poliaria, ostrina, todara*, pl. xlv, figs. 13 & 14, p. 431, SWINHOE, P. Z. S. 1889, n. spp.

Ligia turanica ; cf. *Rhabinopteryx*, Noctuidæ.

Anisopteryx vernata, ravages of ; LINTNER, Rep. N. Y. Mus. xl, pp. 93-96.

Larentia granitalis, Dharmasala, BUTLER, p. 114, pl. cxxxvii, fig. 8, Ill. Lep. Het. vii, n. sp.

Eupithecia gueneata, Mill, n. var. *busambraria* ; RAGUSA, Nat. Sicil. viii, p. 229, pl. iii, figs. 3 & 4. *E. extensaria*, habits and larva ; BARRETT, Ent. M. M. xxv, p. 258. *E. valerianata*, Hb., notes on, and larva ; JOURDHEVILLE, Ann. Soc. Ent. Fr. (6) ix, pp. 109 & 110.

E. infestata, E. India, SWINHOE, P. Z. S. 1889, p. 430 ; *E. fulvipennis*, pl. cxxxvii, fig. 9, *atrignis*, fig. 10, p. 114, *lucigera*, fig. 11, *hookingii*, fig. 12, p. 115, Dharmasala, BUTLER, Ill. Lep. Het. vii : n. spp.

Doleroseoles, n. g., near *Eupithecia*, for *D. bryoscopa*, n. sp., New Guinea, and *E. erymna*, Meyr. ; MEYRICK, Tr. E. Soc. 1889, p. 480.

Bemories melanoceros, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 481, n. sp.

Lobophora rufinotata, N. India, BUTLER, p. 116, pl. cxxxvii, fig. 13, Ill. Lep. Het. vii, n. sp.

Thera consimilis, N. India, BUTLER, p. 116, pl. cxxxvii, fig. 14, Ill. Lep. Het. vii, n. sp.

Melanippe minuta, pl. cxxxvii, figs. 15 & 16, *despicienda*, fig. 17, Dharmasala, BUTLER, p. 117, Ill. Lep. Het. vii ; *M. ? undulata*, Kiukiang, LEECH, p. 147, pl. ix, fig. 15, Tr. E. Soc. 1889 : n. spp.

Coremia divergens, Dharmasala, BUTLER, p. 118, pl. cxxxvii, fig. 18, Ill. Lep. Het. vii, n. sp.

Arichanna maculata, Moore, figured ; WATERHOUSE, Aid, pl. 184, fig. 6.

Scotosia indistincta, Dharmasala, BUTLER, p. 118, pl. cxxxvii, fig. 19, Ill. Lep. Het. vii, n. sp.

Ciduria sordidata and *trifasciata*, varr. of noticed : ZIEGLER, B. E. Z. xxxiii, p. 7, S. B. *O. reticulata*, Moore, figured ; WATERHOUSE, Aid, pl. 184, fig. 5. *C. aqueata*, Hb., larva described ; HABICH, S. E. Z. 1, p. 348.

C. hortensaria = (*hortulanaria*, Gr.), p. 251, *directaria*, p. 268, Amurland, GRAESER, B. E. Z. xxxiii ; *C. multifaria*, Darjeeling, SWINHOE, P. Z. S. 1889, p. 429, pl. xlv, fig. 9 ; *C. nivicincta*, pl. cxxxvii, fig. 20, *multistriata*, fig. 21, Dharmasala, BUTLER, p. 119, Ill. Lep. Het. vii : n. spp.

Gandariitis flavata, Moore, figured ; WATERHOUSE, Aid, pl. 184, fig. 7.

Carsia uniformata, Berg, = (*Synneuria virgellata*, Mab.) ; BERG, p. ccxli, Bull. Soc. Ent. Fr. (6) ix.

Lithostegia levata, Achal Tekke, CHRISTOPH, Rom. Mem. v, p. 50, pl. iii, fig. 5, n. sp.

Olezia tibiale, Esp., larva described ; HABICH, S. E. Z. 1, p. 349.

Declana ; cf. *Noctuidæ*.

PYRALIDÆ, EPIPASCHIIDÆ, SICULODIDÆ.

[Cf. BUTLER (113), CHRISTOPH (748), HULST (411), LEECH (487), MEYRICK (567, 569), SWINHOE (852), WARREN (896).]

[N.B.—Arrangement alphabetical.]

Acharana phœopteralis, Gn., synonymy discussed at length ; WARREN, Tr. E. Soc. 1889, p. 282.

Ancyloptila, n. g. (*Botylidæ*), for *Margarodes lactoides*, Pag. ; MEYRICK, Tr. E. Soc. 1889, p. 509.

Anemosa (?) *roseobrunnea*, Amazons, WARREN, Tr. E. Soc. 1889, p. 260, n. sp.

Asopia farinalis, L., habits of larva ; CHRÉTIEN, Bull. Soc. Ent. Fr. (6) ix, p. clxxvii.

Attacupa, n. g. (*Epipaschiidæ*), p. 71, for *Tetralopha callipeplella*, Hulst ; HULST, Ent. Am. v, p. 71.

Azasia ; cf. *Noctuidæ*.

Belonepholis, n. g. (*Epipaschiidæ*), p. 89, for *B. striata*, n. sp., Dharmasala, p. 91, pl. cxxxiv, fig. 3 ; BUTLER, Ill. Lep. Het. vii.

Botyodes aurealis, pl. iii, fig. 7, Japan, *principalis*, fig. 9, Japan and China, LEECH, p. 69, Ent. xxii, n. spp.

Botys lybialis, Wlk., = (*amatalis*, Wlk.), generic position discussed; WARREN, p. 271, Tr. E. Soc. 1889. *B. dorcalis*, Gn., figured, pl. xi, fig. 7, noticed, p. 230, Rom. Mem. v.

B. lugubralis, N. Japan, pl. iii, fig. 6, *maculalis*, Tsuruga, fig. 11, *gladialis*, Foochau, figs. 5 & 15, p. 67, *fuscomarginalis*, fig. 4, *mandarinalis*, fig. 14, *inornatalis*, fig. 13, Japan, *curvalis*, fig. 3, *ningpoalis*, fig. 1, China, p. 68, *lacrymalis*, fig. 12, *genialis*, fig. 10, Japan, *pacalis*, pl. iv, fig. 15, China, p. 69, LEECH, Ent. xxii, n. spp.

Cacozelia, Grote, maintained as valid; HULST, Ent. Am. v, p. 61.

Cataclysta prodigalis, Corea, LEECH, p. 70, pl. iv, fig. 16, Ent. xxii; *C. trilinealis*, Amazons, WARREN, Tr. E. Soc. 1889, p. 295 : n. spp.

Cataprosopus pauperalis, Japan, LEECH, p. 70, pl. iv, fig. 11, Ent. xxii, n. sp.

Cenoloba, Wlsm., referred to *Pyrallidæ*, near *Epharpastis*, MEYRICK; MEYRICK, Ent. M. M. xxv, p. 373.

Chloauges, Ld., merged in *Margarodes*; MEYRICK, Tr. E. Soc. 1889, p. 508, n. sp.

Chrysaugidæ, extent of the group defined; WARREN, Tr. E. Soc. 1889, p. 257.

Cindaphia tricolor, Dharmasala, BUTLER, p. 95, pl. cxxxiv, fig. 18, Ill. Lep. Het. vii, n. sp.

Cirrhochrista, Ld., characters and position discussed; MEYRICK, Tr. E. Soc. 1889, p. 507.

Coptobasis segnalis, Japan and China, LEECH, p. 65, pl. iv, fig. 4, Ent. xxii, n. sp.

Crochiphora testulalis, variation, distribution, and synonymy noticed; WARREN, Tr. E. Soc. 1889, p. 290.

Crociodcnemis, n. g. (*Desmiadæ*), p. 268, for *C. pellucida*, n. sp., Amazons, p. 269; WARREN, Tr. E. Soc. 1889.

Cyclocausta, n. g. (*Megaphysidæ*), for *C. trilineata*, n. sp., Amazons; WARREN, p. 274, Tr. E. Soc. 1889.

Danaga pullatalis, Andaman Is., SWINHOE, P. Z. S. 1889, p. 420; *D. picata*, pl. cxxxiv, fig. 17, *biformis*, pl. cxxxv, figs. 2 & 3, Dharmasala, BUTLER, p. 94, Ill. Lep. Het. vii : n. spp.

Desmia sepulchralis, Wlk., referred to *Æliodes*; WARREN, p. 270, Tr. E. Soc. 1889.

D. sodalis, Japan and China, LEECH, p. 71, pl. iv, fig. 6, Ent. xxii, n. sp.

Deuterophysa, n. g. (*Megaphysidæ*), p. 272, for *D. costimaculalis*, n. sp., Amazons, p. 273; WARREN, Tr. E. Soc. 1889.

Diseemia distinctalis, Ningpo, LEECH, p. 67, pl. iv, fig. 5, Ent. xxii, n. sp.

Diastreptoneura, n. g. (*Hapaliidæ*), p. 279, for *D. distorta*, n. sp., Amazons, p. 280; WARREN, Tr. E. Soc. 1889.

Diatraea saccharalis, injuries in India; COTES, Ind. Mus. Notes, i, pp. 22-27, pl. ii, fig. 2.

Diploptyla longipalpis, Dharmasala, BUTLER, p. 95, pl. cxxxv, fig. 4, Ill. Lep. Het. vii; *D. chloronota*, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 514 : n. spp.

Endocrossis, n. g. (*Botyridæ*), for *Botyodes flavibasalis*, Moore; MEYRICK, p. 515, Tr. E. Soc. 1889.

Endotricha bicoloralis, Gensan, LEECH, p. 65, pl. iv, fig. 17, Ent. xxii; *E. persicopa*, N. Guinea, MEYRICK, Tr. E. Soc. 1889, p. 506 : n. spp.

Epichronistis (?) *albiguttalis*, Amazons, WARREN, Tr. E. Soc. 1889, p. 289, n. sp.

Epipaschiinæ, characters and affinities discussed; HULST, Ent. Am. v, pp. 41-50, 73, & 74.

Euclita dharmasala, pl. cxxxiv, fig. 13, *fortis*, fig. 14, N. India, BUTLER, p. 92, Ill. Lep. Het. vii, n. spp.

Eudiptis hyalinata = (*Phakellura gigantalis*, Snell.); WARREN, Tr. E. Soc. 1889, p. 265.

Gudeana ? *ossea*, Dharmasala, BUTLER, p. 96, pl. cxxxv, fig. 6, Ill. Lep. Het. vii, n. sp.

Glyphodes bipunctalis, Japan and Corea, LEECH, p. 70, pl. iii, fig. 2, Ent. xxii; *G. megalopa*, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 509 : n. spp.

Hapalia pallidipennis, *sublatalis*, p. 285, *flavidensalis*, p. 287, Amazons, WARREN, Tr. E. Soc. 1889, n. spp.

Haritala definita, Dharmasala, BUTLER, p. 97, pl. cxxxv, fig. 9, Ill. Lep. Het. vii, n. sp.

Heliothela nigralbata, Japan, LEECH, p. 65, pl. iv, fig. 7, Ent. xxii; *H. pusilla*, Dharmasala, BUTLER, p. 93, pl. cxxxiv, fig. 15, Ill. Lep. Het. vii : n. spp.

Heterocnephæ, Ld., merged in *Glyphodes*; MEYRICK, Tr. E. Soc. 1889, p. 511.

H. venosa, Dharmasala, BUTLER, p. 98, pl. cxxxv, fig. 7, Ill. Lep. Het. vii, n. sp.

Hoterodes nervosa, Amazons, WARREN, Tr. E. Soc. 1889, p. 262, n. sp.

Hyalea aurantiacalis, Amazons, WARREN, Tr. E. Soc. 1889, p. 289, n. sp.

Hydrocampa interruptalis n. var. *separatalis*, p. 71, pl. iv, figs. 2 & 13, LEECH, Ent. xxii.

H. simplicis, Lower Sind, SWINHOE, P. Z. S. 1889, p. 421, n. sp.

Hypotia atomalis, Achal Tekke, CHRISTOPH, Rom. Mem. v, p. 51, pl. iii, fig. 6, n. sp.

Ica nebulosa, Amazons, WARREN, Tr. E. Soc. 1889, p. 261, n. sp.

Lamprosema lunulalis, Hb. : to this are referred as synonyms, *Desmia pealealis* and *cancealis*, Wlk., *Botys dorisalis*, *codrusalis*, *ænippealis*, Wlk.; WARREN, Tr. E. Soc. 1889, p. 270.

Leptosteges, n. g. (*Steniidæ*), p. 291, for *L. pulverulenta*, n. sp., Amazons, p. 292; WARREN, Tr. E. Soc. 1889.

Lepyrodes, Gn. : this should include *Phalangiodes*, Gn., *Rhimphulea*, Ledl., and *Synclerus*, Ledl.; MEYRICK, Tr. E. Soc. 1889, p. 513.

L. circotoma, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 513; *L. floralis*, Tsuruga, LEECH, p. 71, pl. iv, fig. 1, Ent. xxii : n. spp.

Leucochroma minoralis, Amazons, WARREN, Tr. E. Soc. 1889, p. 267, n. sp.

Lorastra, Wlk., referred to *Epipaschiidæ*, its extent defined, synonymy of the species; WARREN, Tr. E. Soc. 1889, p. 258.

L. pilosa, p. 258, *funerea*, p. 259, Amazons, WARREN, Tr. E. Soc. 1889, n. sp.

Mecyna deprivalis, Wlk., larva described; MEYRICK, Tr. N. Z. Inst. xxi, p. 188.

Metasia acharis, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 518, n. sp.

Microscia exusta n. var. *erecta*; LEECH, Ent. xxii, p. 66, pl. iv, fig. 3.

M. marginipunctalis, Japan, pl. iv, fig. 10, *subrosealis*, fig. 14, Ningpo, LEECH, p. 66, Ent. xxii, n. spp.

Nausinoë euroalis, E. India, SWINHOE, P. Z. S. 1889, p. 420, pl. xlv, fig. 12, n. sp.

Nosophora lymphatalis, E. India, SWINHOE, P. Z. S. 1889, p. 420, pl. xlv, fig. 7, n. sp.

Notarcha paraphragma, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 517, n. sp.

Oligostigma locuples, pl. cxxxv, fig. 7, *dices*, fig. 8, Dharmasala, BUTLER, p. 97, Ill. Lep. Het. vii, n. spp.

Oneida, n. g. (*Epipaschiidæ*), for *Toripalpus lunulalis*, Hulst; HULST, Ent. Am. v, p. 63.

Orobena vagabundalis, Achal Tekke, CHRISTOPH, Rom. Mem. v, p. 53, pl. iii, fig. 7, n. sp.

Oryba regalis, Corea, LEECH, p. 71, pl. iv, fig. 9, Ent. xxii, n. sp.

Pagyda salcalis, Wlk., genus and species redescribed; MEYRICK, Tr. E. Soc. 1889, p. 516.

Paraponyx flavimarginalis, Amazons, WARREN, Tr. E. Soc. 1889, p. 295, n. sp.

Phostria, Hb., referred to *Hapaliadæ* and redescribed, *Botys oajacalis*, Wlk., and *pelialis*, Feld., referred to it; WARREN, Tr. E. Soc. 1889, pp. 276 & 277.

Pilocrosis amissalis, Gn., = (*Botys agavealis* and *lysanderalis*, Wlk.); WARREN, Tr. E. Soc. 1889, p. 280.

Polythlipta liquidalis, Corea, LEECH, p. 70, pl. iii, fig. 8, Ent. xxii, n. sp.

Porphyritis maculata, Dharmasala, BUTLER, p. 93, pl. cxxxiv, fig. 16, Ill. Lep. Het. vii, n. sp.

Præneste (sub *Botys*) *scyllalis*, Wlk., variation and synonymy; WARREN, Tr. E. Soc. 1889, p. 281.

Pterygisus flavalis, Amazons, WARREN, Tr. E. Soc. 1889, p. 293, n. sp.

Pyralis? *trilatialis*, Wlk., referred to *Anthophila*, p. 66, figured, pl. cxxix, fig. 11; BUTLER, Ill. Lep. Het. vii.

P. dulciculis, E. India, SWINHOE, P. Z. S. 1889, p. 418; *P. princeps*, pl. cxxiv, fig. 10, *fumipennis*, fig. 11, *princeps*, fig. 12, Dharmasala, BUTLER, p. 91, Ill. Lep. Het. vii: n. spp.

Rhodoneura albatalis, E. India, SWINHOE, P. Z. S. 1889, p. 432, pl. xlv, figs. 1 & 2, n. sp.

Salbia lauralis, Wlk., referred to *Desmia*; WARREN, Tr. E. Soc. 1889, p. 267.

S. pellucidalis, Amazons, WARREN, p. 268, Tr. E. Soc. 1889, n. sp.

Samia fumidalis, Japan, LEECH, p. 70, pl. iv, fig. 8, Ent. xxii, n. sp.

Scaptosyle cærulescens, Solomon Is., BUTLER, Tr. E. Soc. 1889, p. 390, n. sp.

Sceliodes cordalis, Dbld., habits of larva ; HUDSON, Tr. N. Z. Inst. xxi, p. 189, pl. viii, fig. 2.

Scirpophaga and *Schenobius*, cf. *Crambidae*.

*Scoparia ambigua*ls, Tr., and *cembra*, Haw., discussed and united ; SNEILEN, Tijdschr. Ent. xxxii, p. 31. *Scoparia dubitalis*, Hub., varr. figured ; BANKER, P. Dorset Field Club, x, pl., figs. 8-10, noticed, p. 202.

Scoparia hemiplaca, New Zealand, MEYRICK, Tr. N. Z. Inst. xxi, p. 155, n. sp.

Scopula eximialis, Wlk., referred to *Mecyna* ; MEYRICK, Tr. E. Soc. 1889, p. 518. *S. daiclenalis*, Wlk., referred to *Mnesictenu*, Meyr., and re-described ; MEYRICK, Tr. N. Z. Inst. xxi, p. 155.

Scopula bisignata, Dharmasala, BUTLER, p. 98, pl. cxxxv, fig. 11, Ill. Lep. Het. vii, n. sp.

Siculodes rhomboidea, Amazons, WARREN, Tr. E. Soc. 1889, p. 262, n. sp.

Sozon obscura, Amazons, WARREN, Tr. E. Soc. 1889, p. 291, n. sp.

Spilotes æruginalis, larva noticed ; CHRÉTIEN, Bull. Soc. Ent. Fr. (6) ix, p. cxli.

Stemmatophora foliata, Nilgiri Hills, SWINHOE, P. Z. S. 1889, p. 418, pl. xlv, fig. 5, n. sp.

Stericta, Led., = (*Winona*, Hulst) ; HULST, Ent. Am. v, p. 62.

Synclera nemoralis, Simla, SWINHOE, P. Z. S. 1889, p. 421, pl. xlv, fig. 6, n. sp.

Synolicastis, n. g., for *S. heteromima*, n. sp., New Guinea ; MEYRICK, p. 507, Tr. E. Soc. 1889.

Ternioptycha, n. g. (*Pyraliidae*), p. 504, for *T. cyanopa*, n. sp., New Guinea, p. 505 ; MEYRICK, Tr. E. Soc. 1889.

Tetralopha, Zell., = (*Wanda*, *Katona*, *Loma*, Hulst) ; HULST, Ent. Am. v, p. 69.

Thysanodesma, n. g. (*Asopiidae*), type *Asopia* ? *præteritalis*, Wlk., and including *T. major*, n. sp., Dharmasala, pl. cxxxv, fig. 3 ; BUTLER, p. 96, Ill. Lep. Het. vii.

Voliba major, Amazons, WARREN, Tr. E. Soc. 1889, p. 293, n. sp.

Yuma, n. g. (*Epipaschiidae*), for *Toripalpus adulatalis*, Hulst ; HULST, Ent. Am. v, p. 65.

Zebromia ornatalis, Foochau, LEECH, p. 71, pl. iv, fig. 12, Ent. xxii, n. sp.

Zonora, n. g., near *Hypotia*, for *Z. opiparalis*, n. sp., E. India, SWINHOE, P. Z. S. 1889, p. 419, n. sp.

CRAMBIDÆ, PHYCITIDÆ.

[Cf. CHRISTOPH (748), FERNALD (263), LEECH (488), MEYRICK (567), RAGONOT (658, 659), RICHARDSON (708), RILEY & HOWARD (720), SWINHOE (852).]

The priority of Zeller's work on *Crambidae* to that of Walker ; FERNALD (263).

Synonymic catalogue of N. American *Phycitidae* and *Galleriidae* ; RAGONOT, Ent. Am. v, pp. 114-117.

Acrobasis minimella, Texas, RAGONOT, Ent. Am. v, p. 113, n. sp.

Acrolepia assectella, habits; STANTON, Ent. M. M. xxv, p. 291. *A. marcidella*, Curt., figured; P. Dorset Field Club, x, pl., fig. 3.

Chilo gansanellus, Corea, LEECH, p. 108, pl. v, fig. 9, Ent. xxii, n. sp.

Crambus warringtonellus, *perlellus*, noticed; CHRÉTIEN, Bull. Soc. Ent. Fr. (6) ix, p. cxxix. *C. caucasicus*, Alph., figured, pl. xii, fig. 5; Rom. Mem. v. *C. alpinellus*, Hub., figured; P. Dorset Field Club, x, pl., fig. 4.

C. ornatellus, p. 106, pl. v, fig. 2, *argentistriellus*, fig. 11, *striatellus*, fig. 3, *distinctellus*, fig. 1, *nigripunctellus*, fig. 10, p. 107, *purellus*, fig. 7, p. 108, Japan and Corea, LEECH, Ent. xxii, n. spp.

Ephestia kuhniella and *interpunctella* in N. America; RILEY & HOWARD, Ins. Life, ii, pp. 166-171.

Epischnia banksiella, S. England, RICHARDSON, P. Dorset Field Club, x, p. 192, pl., figs. 1-1b, n. sp.

Elamopalpus bipartitellus, Japan, LEECH, p. 108, pl. v, fig. 4, Ent. xxii, n. sp.

Homœosoma nimbella, description of larva; PORRITT, Ent. M. M. xv, p. 245.

Laodamia pernigerella, New Guinea, RAGONOT, Bull. Soc. Ent. Fr. (6) ix, p. ccxix, n. sp.

Magiria robusta, Moore, habits, metamorphosis; COTES, Ind. Mus. Notes, i, pp. 35 & 36, pl. iii, fig. 3.

Melitene bifidella, Japan, LEECH, Ent. xxii, p. 108, pl. v, fig. 8, n. sp.

Myelois nigripalpella, Achal Tekke, CHRISTOPH, Rom. Mem. v, p. 55, pl. iii, fig. 8; *M. subtriciella*, *zonulella*, N. America, RAGONOT, Ent. Am. v, p. 113; n. spp.

Nephopteryx bicolorella, Tokio, LEECH, p. 108, pl. v, fig. 5, Ent. xxii, n. sp.

Palibothra, n. g., near *Nephopteryx*, p. ccxviii, for *P. fuscogrisella*, n. sp., New Guinea; RAGONOT, Bull. Soc. Ent. Fr. (6) ix.

Pupua, n. g., near *Emmalocera*, for *P. latilimbella*, n. sp., New Guinea; RAGONOT, p. ccxxx, Bull. Soc. Ent. Fr. (6) ix.

Phycis rubrifusciella, larva described; BEUTENMÜLLER, Ent. Am. v, p. 38.

Piesmopoda ouropurpurella, *mimella*, New Guinea, RAGONOT, Bull. Soc. Ent. Fr. (6) ix, p. ccxviii, n. spp.

Propachys flavifrontalis, China, LEECH, p. 108, pl. v, fig. 6, Ent. xxii, n. sp.

Ptychopseustis, n. g., for *Diptychophora amanella*, Snell; MEYRICK, p. 521, Tr. E. Soc. 1889.

Salebria marmorata, Alph., figured, pl. xii, fig. 6, Rom. Mem. v.

S. mæstella, *euzopherella*, New Guinea, RAGONOT, Bull. Soc. Ent. Fr. (6) ix, p. ccxix, n. spp.

Saluria dichrocella, Texas, RAGONOT, Ent. Am. v, p. 113, n. sp.

Schaenobius chionotus, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 519, n. sp.

Scirpophaga butyrota, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 520, n. sp.

Sigmarthria aspiciella, New Guinea, RAGONOT, Bull. Soc. Ent. Fr. (6) ix, p. ccxx, n. sp.

- Surattha eremialis*, E. India, SWINHOE, P. Z. S. 1889, p. 422, n. sp.
Thinasotia ænochræis, New Guinea, MEYRICK, Tr. E. Soc. 1889, p. 520, n. sp.
Ugra parallela, Wlk., referred to *Pyralididæ*; WARREN, Tr. E. Soc. 1889, p. 260.

TORTRICIDÆ.

[Cf. FERNALD (262), MEYRICK (569), RAGONOT (656, 657), REBEL (664) WOOD (934).]

WALLENGREN continues his descriptions of Scandinavian *Tortricidæ* in Ent. Tidskr. x, pp. 17, &c.

Teras fimbrianum, habits and variation, pp. 290-292, *lubricanum*, habits and characters, pp. 293-295; HERING, S. E. Z. 1. *T. ferrugana*, reared from galls on *Betula*; RÜBSAAMEN, p. 63, B. E. Z. xxxiii.

Tortrix decretana, habits, description of larva; ATMORE, Ent. M. M. xxv, p. 243. *T. crategana*, early stages of; CHRÉTIEN, Le Nat. 1889, p. 282.

T. citrana, California, FERNALD, Ent. Am. v, p. 18, n. sp.

Cactecia excessana, Wlk., habits noticed; HUDSON, Tr. N. Z. Inst. xxi, p. 193, pl. viii, figs. 5 & 6.

C. astrologana, New Zealand, MEYRICK, Tr. N. Z. Inst. xxi, p. 156, n. sp.

Proselena eribola, New Zealand, MEYRICK, Tr. N. Z. Inst. xxi, p. 156, n. sp.

Amphysa gaditana, Spain, RAGONOT, Bull. Soc. Ent. Fr. (6) ix, p. cxxx, n. sp.

Sciaphila orientata, Alph., figured, pl. xii, fig. 7; Rom. Mem. v.

Conchylis alismana, Rag., figured, pl. viii, fig. 11, synonymy, p. 297; REBEL, Verh. z.-b. Wien, xxxix.

Cochylis peucedanana, Carcassonne, RAGONOT, Bull. Soc. Ent. Fr. (6) ix, p. cv, n. sp.

Retinia turionella, L., variation and synonymy; BARRETT, Ent. M. M. xxv, p. 181, and WARREN, pp. 196-199. *R. posticana*, Zett., larva and pupa noticed; WARREN, Ent. M. M. xxv, p. 307.

Eupœcilia dubitana, Hb., food-plant; BARRETT, Ent. M. M. xxv, p. 430.

Sericoris antiquana, injurious to *Stachys palustris*, L.; LANFA, Ent. Tidskr. x, p. 85. *S. fuligana*, Haw., larva described; BARRETT, Ent. M. M. xxv, p. 430.

Grapholitha tetragrammana, Stgr., figured, pl. viii, fig. 1, noticed, p. 300; REBEL, Verh. z.-b. Wien, xxxix.

G. exquisitana, Vienna, REBEL, Verh. z.-b. Wien, xxxix, p. 301, pl. viii, fig. 2, n. sp.

Acrolita consequana = (*Grapholitha littorana*, Const.); WARREN, p. 173, Ent. M. M. xxv.

Carpocapsa, sp. injurious to peaches in Japan; Ins. Life, ii, p. 64. *C. pomonana*, metamorphoses; PIRSON, Le Nat. 1889, p. 60.

Ephippiphora gallicolana, habits of larva; WOOD, Ent. M. M. xxv, p. 219.

Coccyx splendidulana and *argyran*, habits of larva ; WOOD, Ent. M.M. xxv, pp. 217 & 218.

Steganopterycha pinicolana, its means of distribution ; COAZ, MT. Gea. Bern. 1888, p. v.

Heusimene fimbriana, habits of larva ; WOOD, Ent. M. M. xxv, p. 218.

Phoxopteris spireafoliana, larva described ; BEUTENMÜLLER, Ent. Am. v, p. 39.

TINEIDÆ.

[Cf. BEUTENMÜLLER (64, 65, 66), CHRISTOPH (748), CONSTANT (157), HERING (373), HOFMANN (388, 389), MEYRICK (567, 568, 569), RAGONOT (656, 657), REBEL (664), RILEY (716), WALSINGHAM (894, 895), WOCKE (933).]

[N.B.—Arrangement alphabetical.]

Acrolophus plumifrontellus, N. America, BEUTENMÜLLER, Ent. Am. v, p. 9, n. sp.

Antidica pilipes, Butl., = (*eriomorpha*, Meyr.) ; MEYRICK, p. 1685, P. Linn. Soc. N.S.W. (2) iii.

Antiopala, n. g. (*Ecophorida*), p. 1646, for *A. tephrea*, n. sp., Tasmania, p. 1647 ; MEYRICK, P. Linn. Soc. N.S.W. (2) iii.

Archyala, n. g., near *Lysiphragma*, for *A. paraglypta*, n. sp., New Zealand ; MEYRICK, p. 159, Tr. N. Z. Inst. xxi.

Aristeia anomodes, Australia, MEYRICK, p. 1653, P. Linn. Soc. N.S.W. (2) iii, n. sp.

Arotura, n. g., WALSINGHAM, printed by error in Zool. Rec. xxv, *Ins.* p. 278, as *Atrotura* ; the latter to be obliterated.

Artiastis, n. g., p. 1674, for *A. heliacma*, *tepida*, Australia, p. 1674, *ptochopa*, Tasmania, p. 1675, n. spp. ; MEYRICK, P. Linn. Soc. N.S.W. (2) iii.

Atheropla, diagnosis of, supplemented ; MEYRICK, p. 1652, P. Linn. Soc. N.S.W. (2) iii.

A. pilopis, p. 1652, *deaspila*, p. 1653, Australia, MEYRICK, P. Linn. Soc. N.S.W. (2) iii, n. spp.

Atkinsonia, Stn., merged in *Oedematopoda*, Z. ; WALSINGHAM, Tr. E. Soc. 1889, p. 19.

Batrachedra eucola, p. 180, *psithyra*, p. 181, New Zealand, MEYRICK, Tr. N. Z. Inst. xxi, n. spp.

Bedellia psammionella, New Zealand, MEYRICK, Tr. N. Z. Inst. xxi, p. 165, n. sp.

Blabophanes lombardica, Centr. Europe, HERING, S. E. Z. I, p. 295, n. sp.

Boletobia fuliginosa, biological note ; RIESEN, S. E. Z. I, p. 8.

Brachynemata amblyteles, Queensland, MEYRICK, p. 1662, P. Linn. Soc. N.S.W. (2) iii, n. sp.

Bucculatrix alaternella, p. cxxv, *helichrysella*, p. cxxvi, *Alpes maritimes*, CONSTANT, Bull. Soc. Ent. Fr. (6) ix, n. spp.

Butalis sinensis, F. & R., = (*Staintonia* ? *apiciguttella*, Christoph) ;

WALSINGHAM, Tr. E. Soc. 1889, p. 8. *B. siccella*, Z., *variella*, Steph., figured, P. Dorset Field Club, x, pl., figs. 6 & 6a.

B. bifissella, Heidelberg, HOFMANN, S. E. Z. 1, p. 107, woodcut, p. 108 ; *B. epistrotia*, New Zealand, MEYRICK, Tr. N. Z. Inst. xxi, p. 161 : n. spp.

Calocotis, n. g., near *Stathmopola*, for *C. crucifera*, n. sp., New Zealand ; MEYRICK, p. 170, Tr. N. Z. Inst. xxi.

Cateristis, n. g., near *Bedellia*, p. 163, for *C. eustyla*, n. sp., New Zealand, p. 164 ; MEYRICK, Tr. N. Z. Inst. xxi.

Cerostoma radiatella, Don., = (*Plutelopectera ochrella*, Chamb.) ; WALSINGHAM, Ins. Life, i, p. 287.

C. substylata, Vancouver I., WALSINGHAM, Ins. Life, i, p. 287 ; *C. aleutianella*, *dubiosella*, Aleutian Is., BEUTENMÜLLER, p. 27, Canad. Ent. xxi : n. spp.

Chuuliodus insecurellus, Stn., figured ; P. Dorset Field Club, x, pl., fig. 2.

Choregia, structure and position noticed ; RILEY, P. E. Soc. Washington, i, p. 158.

Chrysoclista bimaculella, variation ; STAINTON, Ent. M. M. xxv, p. 169. *Circostola*, n. g., between *Zelleria* and *Argyresthia*, for *C. copidota*, n. sp., New Zealand ; MEYRICK, p. 163, Tr. N. Z. Inst. xxi.

Cesya annularis = (*Philobota athletica*, Ros.) ; MEYRICK, p. 1688, P. Linn. Soc. N.S.W. (2) iii.

C. thermistis, *leptosyla*, p. 1654, *phæocosma*, *stereosema*, p. 1655, *phæozona*, *crocinaestis*, p. 1656, *comozyantha*, *menodora*, p. 1657, *asthenopsis*, *noserodes*, p. 1658, *paraderces*, *hemiphragma*, p. 1659, *melanoscia*, *innumera*, p. 1660, *psilostola*, p. 1661, *dictyodes*, p. 1662, Australia, MEYRICK, P. Linn. Soc. N.S.W. (2) iii, n. spp.

Coleophora tritici, Lind., notes on ; HOFMANN, S. E. Z. 1, p. 278. *C. flavaginella*, L., and case of larva figured ; P. Dorset Field Club, x, pl., figs. 5 & 5a. *C. vulneraria*, habits of larva ; BIRD, Ent. M. M. xxv, p. 382. *C. albitarsella*, Z., food-plant of larva ; CHRÉTIEN, Bull. Soc. Ent. Fr. (6) ix, p. clxxvii.

C. serpylletorum, Stettin ; HERING, S. E. Z. 1, p. 305 ; *C. santolinella*, Corsica, CONSTANT, Bull. Soc. Ent. Fr. (6) ix, p. cxxv : n. spp.

Compsotropha hemispila, *xanthodelta*, Australia, MEYRICK, p. 1636, P. Linn. Soc. N.S.W. (2) iii, n. spp.

Cosmopteryx schmidiella var. *obsoleta* noticed, p. 211, figured, pl., fig. 11 ; BANKES, P. Dorset Field Club, x. *C. schmidiella* var. described ; BANKES, Ent. M. M. xxv, p. 307. *C. orichalcea*, food-plant of ; HERING, Ent. M. M. xxv, p. 212.

C. herniella, Stettin, HERING, S. E. Z. 1, p. 308 ; *C. floridanella*, *minuteila*, Florida, BEUTENMÜLLER, Ent. Am. v, p. 10 ; *C. nitens*, *chulybella*, Texas, p. 289, *delicatella*, N. Carolina, p. 290, *unicolorella*, California, p. 291, WALSINGHAM, Ins. Life, i : n. spp.

Crossophora aëtodes, Australia, MEYRICK, p. 1673, P. Linn. Soc. N.S.W. (2) iii, n. sp.

Cryptolechia, and allied genera, characters of, p. 150 ; *C. quercicella*, Clem., = (*Psilocosia dubitella*, Z., *reflexella*, Clem., = (*quercicella*, Z.), p. 151 ; WALSINGHAM, Ins. Life, ii.

Depressaria cinereocostella, Clem., is prior to *clausella*, Wlk., p. 255, *paritella*, Tr., var. *novomundi*, note on, p. 256; WALSINGHAM, *Ins. Life*, i. *D. irrorata*, Stgr., = (*anthriscella*, Br.); BROWN, C.R. Soc. L. Bord. 1888, p. xiv. *D. oinochroa*, Turati, noticed at length; REBEL, *Verh. z.-b. Wien*, xxxix, p. 310.

D. daucivorella, Rouen, RAGONOT, *Bull. Soc. Ent. Fr.* (6) ix, p. cvi; *D. ragonoti*, Austria, REBEL, *Verh. z.-b. Wien*, xxxix, p. 308, pl. viii, fig. 10; *D. curvilineella*, New York, BEUTENMÜLLER, *Ent. Am.* v, p. 10; *D. togata*, p. 254, *solidaginis*, p. 255, *fernaldella*, p. 256, *lythrella*, *gracilis*, p. 257, N. America, WALSINGHAM, *Ins. Life*, i : n. spp.

Elachista diderichsiella, Pomerania, HERING, S. E. Z. i, p. 313; *E. subquadrrella*, Sèvres, RAGONOT, *Bull. Soc. Ent. Fr.* (6) ix, p. cvi; *E. melanura*, *gerasmia*, p. 177, *thallophora*, *helonoma*, *exaula*, p. 178, *ombrodoca*, *archæonoma*, p. 179, New Zealand, MEYRICK, *Tr. N. Z. Inst.* xxi : n. spp.

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Eriodyti, Meyr., restricted to *E. contentella*, definition amended; MEYRICK, p. 1637, *P. Linn. Soc. N.S.W.* (2) iii.

Eulechria, tabulation of the 93 described Australian species of; MEYRICK, pp. 1567–1575, *P. Linn. Soc. N.S.W.* (2) iii.

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Gravilaria arenosella, Wlk., referred to *Butrachelra*; MEYRICK, *Tr. N. Z. Inst.* xxi, p. 181.

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Heliocausta serera, larva described; MEYRICK, p. 1682, P. Linn. Soc. N.S.W. (2) iii.

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Hieropola, Meyr., merged in *Hoplitica*; MEYRICK, p. 1595, P. Linn. Soc. N.S.W. (2) iii.

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Hyponomeuta eronymella, abdominal glands in larva; SCHAEFFER, Zool. Jahrb. iii, Anat. Abth. pp. 612-619: blood formation; *id. t. c.* pp. 626-630. *H. cognatella*, malformation of; BANKES, Ent. M. M. xxv, p. 306.

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Ioptera demica, Melbourne, MEYRICK, p. 1589, P. Linn. Soc. N.S.W. (2) iii, n. sp.

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Lita salicorniæ, Eisleben, HERING, S. E. Z. 1, p. 302; *L. cistiflorella*, *dephinatella*, *behenella*, Alps, CONSTANT, Bull. Soc. Ent. Fr. (6) ix, p. cxxv : n. spp.

Lithocolletis, list of the N. American species and their food-plants; 1889. [VOL. XXVI.]

WALSINGHAM, *Ins. Life*, ii, pp. 119 & 120. *L. ulmella*, Chamb., = (*modesta*, F. & B.), *conglomeratella*, Z., = (*bicolorella*, Chamb., and *obtusiloba*, F. & B.), *basistrigella*, Cl., = (*intermedia*, F. & B.), *rileyella*, Chamb., = (*tenistrigata*, F. & B.), *quercibella*, Chamb., = (*subaureola*, F. & B.), *argenti-fimbrella*, Cl., = (*quercialbella*, Fitch, *longestriata*, F. & B., *fuscocostella*, Chamb.); WALSINGHAM, *Ins. Life*, ii, pp. 24 & 25. *L. fragilella*, characters of, *consimilella* and *affinis*, F. & B., notes on, p. 51, *lucetiella*, Cl., = (*enigmatella*, F. & B.), *celtifoliella*, Chamb., synonymy, *morrisella*, Fitch, = (*texanella*, Z.), p. 52, *uhlerella*, F., = (*amorphælla*, Chamb., *amorphe*, F. & B.), *ostensackenella*, Fitch, = (*ornatella*, Chamb.), *gemmea*, F. & B., note on, p. 53; WALSINGHAM, *Ins. Life*, ii. *L. sublauteella* and *delitella*, mines and habits of larvæ; WALSINGHAM, *Bull. Soc. Ent. Fr.* (6) ix, p. ccxxxiii.

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Mesolecta xanthastis, *callistis*, W. Australia, MEYRICK, p. 1602, *P. Linn. Soc. N.S.W.* (2) iii, n. spp.

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Nemotois demaisonii, Algeria, RAGONOT, *Bull. Soc. Ent. Fr.* (6) ix, p. cv, n. sp.

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Ecophora politis, Meyr., redescribed; MEYRICK, *Tr. N. Z. Inst.* xxi, p. 187. *Æ. stipella*, food of larva; ELLISON, *Ent. M. M.* xxv, p. 457. *Æ. pseudopretella*, egg and young larva described; CHRÉTIEN, *Le Nat.* 1889, p. 94.

Æ. bruandella, S. France, RAGONOT, *Bull. Soc. Ent. Fr.* (6) ix, p. cvi;

Æ. ardosiella, Corsica, *incolorella*, Alpes-maritimes, CONSTANT, Bull. Soc. Ent. Fr. (6) ix, p. cxxv; *Æ. gelechiella*, Sicily, WOCKE, Nat. Sicil. ix, p. 2; *Æ. cosmanthes*, p. 1671, *hilaropa*, *protadelpha*, p. 1672, Australia, MEYRICK, P. Linn. Soc. N.S.W. (2) iii : n. spp.

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- Talantis*, n. g. (*Ecophoridae*), for *T. chimerina*, n. sp., Australia; MEYRICK, p. 1601, P. Linn. Soc. N.S.W. (2) iii.
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(D.) *DIPTERA.*

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kow (880) : blood and fat-body formation in larva ; SCHÄFFER, *Zool. Jahrb.* iii, pp. 632-634.

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Heteroptera acutangula, Zett., note on the wing-structure of ; GERCKE, p. 225, pl. ii, fig. 9, *Wien. ent. Z.* viii.

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Hippobosca struthionis, S. Africa, JANSON, *Ormerod, Injur. ins. S. Afr.* pp. 56-60, n. sp.

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- B. gibbosa*, Minas Geraes, FALLOU, Le Nat. 1889, p. 120, n. sp.
- Ctenomorpha implexa*, Matabele Land, DISTANT, Oates' Matabele Land, ed. ii, p. 386, n. sp.
- Camirus pullatus*, Centr. and S. America, DISTANT, p. 316, pl. xli, Biol. Centr. Am. Rhynch., n. sp.
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- Dalpada pallipes*, New Britain, FALLOU, Le Nat. 1889, p. 130, n. sp.
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Anisocelis rufipennis, Minas Geraes, FALLON, Le Nat. 1889, p. 131, n. sp.

Enoplops sibirica, Irkutsk, JAKOWLEW, Hor. Ent. Ross. xxiii, p. 54, n. sp.

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Tropistethus seminitens, Teneriffe, PUTON, Rev. d'Ent. viii, p. 302, n. sp.

TINGITIDÆ, PHYMATIDÆ, ARADIDÆ.

Acanthochila exquisita, Florida, UHLER, P. E. Soc. Washington, i, p. 143, n. sp.

Aneurus dissimilis, Brazil, BERGROTH, p. 52, Wien. ent. Z. viii, n. sp.

Aradus abbas, Canada, BERGROTH, C.R. ent. Belg. xxxiii, p. clxxx ;

A. vitiosus, p. 77, *ampliocollis*, p. 78, Siberia, JAKOWLEW, Hor. Ent. Ross. xxiii : n. spp.

Artabanus sinuatus, Stål, = (*Cinyphus furcatus*, Sign.) ; BERGROTH, C.R. ent. Belg. xxxiii, p. clxxxii.

Brachyrrhynchus gradatus, horvathi, Petropolis, BERGROTH, p. 49, Wien. ent. Z. viii, n. spp.

Carcentus, Stål, = (*Acorium*, Sign.) ; BERGROTH, C.R. ent. Belg. xxxiii, p. clxxxii.

C. stålî, New Guinea, BERGROTH, C.R. ent. Belg. xxxiii, p. clxxxi, n. sp.

Ctenoneurus necopinatus, St. Thomas, W. Indies, BERGROTH, p. 51, Wien. ent. Z. viii, n. sp.

Phymatus erosa, H.-Sch., habits : LINTNER, Rep. N. Y. Mus. xl, p. 107.

Pictinus hirticornis, Brazil, BERGROTH, p. 50, Wien. ent. Z. viii, n. sp.

Neuroctenus frugalis, Brazil, BERGROTH, p. 52, Wien. ent. Z. viii, n. sp.

Tingis spinosa, Mexico, DUGÈS, Nat. Mex. (2) i, p. 208, pl. xviii, part, n. sp.

CAPSIDÆ.

Capsus quadricittatus, food-plants ; MANNING, Ins. Life, i, p. 293.

Chilocrates, n. g., near *Cyphodema*, for *C. lenzii*, n. sp., Kashmir ; HORVATH, Term. füzetek, xii, p. 39.

Eccritotarus exultans, Trinidad, DISTANT, Ent. M. M. xxv, p. 202, n. sp.

Helopeltis, list of the species of ; BERGROTH, Ent. M. M. xxv, p. 272.

H. febriculosa, Sikkim, BERGROTH, Ent. M. M. xxv, p. 271, n. sp.

Lopus infuscatus, Br., n. var. *turcomanus* ; HORVATH, p. 174, Wien. ent. Z. viii.

Lygus pratensis injurious to fuchsias ; KARSCH, Ent. Nachr. xv, p. 57.

Macrotylus dimidiatus, Siberia, JAKOWLEW, Hor. Ent. Ross. xxiii, p. 69, n. sp.

Mauroductylus limbatellus, Madeira, PUTON, Rev. d'Ent. viii, p. 306, n. sp.

Monalonion humerale, politum, and *divisum*, Walk., referred to *Disphinctus*, Stål ; BERGROTH, Ent. M. M. xxv, p. 271.

- Psallus proteus*, Madeira, PUTON, Rev. d'Ent. viii, p. 305, n. sp.
Rhopalotomus niger, Siberia, JAKOWLEW, Hor. Ent. Ross. xxiii, p. 70, n. sp.
Systratiolus aterrimus, Siberia, JAKOWLEW, Hor. Ent. Ross. xxiii, p. 69, n. sp.
Tuponia? rubella, Teneriffe, PUTON, Rev. d'Ent. viii, p. 307, n. sp.

ANTHOCORIDÆ, CIMICIDÆ, SALDIDÆ.

- Anthocoris visci*, England, DOUGLAS, Ent. M. M. xxv, p. 427, n. sp.
Ceratocombus corticalis, Finland, REUTER, Medd. Soc. Fenn. xv, p. 156, n. sp.
Piezostethus formicetorum, habits noticed; WASMANN, p. 191, Deutsche e. Z. 1889.
Salda saltatoria and *lateralis*, habits of; MASON, Ent. M. M. xxv, p. 236.
S. reuteri, p. 66, *micans*, p. 68, Siberia, JAKOWLEW, Hor. Ent. Ross. xxiii, n. spp.

NABIDÆ, EMESIDÆ, REDUVIIDÆ.

- Acidoparius albospinosus*, Minas Geraes, FALLOU, Le Nat. 1889, p. 151, n. sp.
Emesa longipes, de G., notes on; WEED, Psyche, v, p. 280.
Harpactor iracundus, larva of; ANDRÉ, Le Nat. 1889, p. 137.
Heregá rufipennis, Mexico, FALLOU, Le Nat. 1889, p. 131, n. sp.
Melanolestes picipes, stinging by it and other *Reduviidæ*; LINTNER, Fourth Rep. pp. 108-114.
Oncocephalus micropterus, Himalaya, HORVATH, Term. füzetek, xii, p. 37, n. sp.
Ploiaria brevispina, Madeira, PUTON, Rev. d'Ent. viii, p. 304, n. sp.
Prostemma kiborti, p. 80, *bivittata*, p. 81, Siberia, JAKOWLEW, Hor. Ent. Ross. xxiii, n. spp.
Rasabus (? misprint for *Rasahus*) *grandis*, Minas Geraes, FALLOU, Le Nat. 1889, p. 150, n. sp.
Spiniger sipolisi, Minas Geraes, FALLOU, Le Nat. 1889, p. 151, n. sp.

HYDROMETRIDÆ, HENICOCEPHALIDÆ.

- Velia noualhieri*, Algeria, PUTON, Rev. d'Ent. viii, p. 307, n. sp.
Henicocephalus, Westw., = (*Henschiella*, Horv.), list of the species; BERGROTH, Rev. d'Ent. viii, p. 319.

HYDROCORISÆ.

- Belostoma americanum, griseum*, eggs of; WEED, Bull. Ohio Exp. Station, i, pp. 14-17, pl. ii, figs. 6 & 7.
Enithares lineatipes, Himalaya, HORVATH, Term. füzetek, xii, p. 39, n. sp.
Mononyx indicus, Sikkim, ATKINSON, J. A. S. B. lvii, p. 345, n. sp.
Ranatra linearis, mimicry in; FISCHER-SIGWART, MT. Aargau Ges. v, p. 162.
Zaitha fluminea, Say, food of; WEED, Bull. Ohio Exp. Station, i, p. 11.

HEMIPTERA-HOMOPTERA.

[Cf. ASHMEAD (14), ATKINSON (16), BUCKTON (111), DISTANT (186, 187, 189, 192), DUZEE (209, 210, 211, 212), HORVATH (399), LETHIERRY (498, 499, 500, 501), PROVANCHER (648), TETENS (853), WOODWORTH (939).]

Fossil *Homoptera* ; see BRAUER, REDTENBACHER, & GANGLBAUER (98), and Palæoentomology, p. 81.

Cicada, taxonomical note ; BUCKTON (111).

CICADIDÆ.

Monograph of Oriental *Cicadidæ*, with systematic arrangement ; DISTANT (186).

Cicada septendecim in 1765 ; WEBSTER, Ins. Life, ii, p. 161.

C. coronata, Sumatra, DISTANT, p. 88, Notes Leyd. Mus. xi, and Ann. N. H. (6) iii, p. 52 ; *C. canadensis*, N. America, PROVANCHER, Faune Can. Hom. p. 213 : n. spp.

Cosmopsaltria, the Oriental species described and figured ; DISTANT, pp. 43, &c., pls. iv, &c., Mon. Oriental *Cicadidæ*.

C. montivaga, Kina Balu, DISTANT, p. 421, Ann. N. H. (6) iii, n. sp.

Dundubia, the species described and figured ; DISTANT, pp. 38-43, pls. iv, &c., Mon. Oriental *Cicadidæ*.

D. mellea, Borneo, DISTANT, p. 40, pl. xii, fig. 9, Mon. Oriental *Cicadidæ* ;

D. emanatura, *amicta*, E. India, DISTANT, p. 51, Ann. N. H. (6) iii : n. spp.

Gviana atkinsoni, p. 49, E. India, *hageni*, p. 50, Sumatra, DISTANT, Ann. N. H. (6) iii, n. spp.

Graptopsaltria colorata, described and figured ; DISTANT, Mon. Oriental *Cicadidæ*, p. 25, pl. ii, fig. 8.

Kamabuta, n. g., for *K. pantherina*, n. sp., Sumatra, DISTANT, p. 52, Ann. N. H. (6) iii, and Notes Leyd. Mus. xi, p. 89.

Leptopsaltria, the species described and figured ; DISTANT, Mon. Oriental *Cicadidæ*, pp. 31-37, pls. viii & x.

L. barbosa, Sulu Is., DISTANT, p. 37, pl. v, fig. 14, Mon. Oriental *Cicadidæ* ; *L. nigrescens*, Java, DISTANT, p. 50, Ann. N. H. (6) iii, and Notes Leyd. Mus. xi, p. 88 ; *L. mascula*, Kina Balu, DISTANT, p. 420, Ann. N. H. (6) iii : n. spp.

Platypleura, the Oriental species described and figured ; DISTANT, Mon. Oriental *Cicadidæ*, pp. 19-23, pls. i & vii, pts.

Pæcilopsaltria, the Oriental species described and figured ; DISTANT, Mon. Oriental *Cicadidæ*, pp. 5-18, pls. i & viii, pt.

Polynœura ducalis, described and figured ; DISTANT, p. 23, pl. ii, fig. 7, Mon. Oriental *Cicadidæ*.

Pomponia viridimaculata, *græcina*, Kina Balu, DISTANT, p. 421, Ann. N. H. (6) iii, n. spp.

Tucua speciosa, described and figured ; DISTANT, p. 24, pl. ii, figs. 9 & 10, Mon. Oriental *Cicadidæ*.

Tosena, the species described and figured ; DISTANT, Mon. Oriental *Cicadidæ*, pp. 25-30, pl. ii.

FULGORIDÆ.

ASHMEAD gives tables of the N. American genera in Ent. Am. v, pp. 1-6 & 21-28.

Amalopota, n. g. (*Derbida*), p. 176, for *A. uhleri*, n. sp., New York, p. 178; DUZEE, Canad. Ent. xxi.

Bruchomorpha oculata, Newm., developed form; DUZEE, Canad. Ent. xxi, p. 7.

Cenestra affinis, Singapore, ATKINSON, J. A. S. B. lvii, p. 341, n. sp.

Cerynia viridula, Bombay, ATKINSON, J. A. S. B. lvii, p. 340, n. sp.

Dictyophora obtusiceps, Algeria, LETHIERRY, Rev. d'Ent. viii, p. 317, n. sp.

Fulgora connectens, *amplectens*, Atk., *andamensis*, Dist., figured, pl. xv; ATKINSON, J. A. S. B. lvii.

F. whiteheadi, Kina Balu, DISTANT, p. 422, Ann. N. H. (6) iii, n. sp.

Helicoptera septentrionalis, p. 220, *vestita*, p. 221, Canada, PROVANCHER, Faune Can. Hem., n. spp.

Hyalesthes productus, Algeria, LETHIERRY, Rev. d'Ent. viii, p. 317, n. sp.

Hysteropterum semicitreum, Canada, PROVANCHER, Faune Can. Hem. p. 218, n. sp.

Messena sinuata, p. 339, S. India, *burmanica*, Palone, p. 340, ATKINSON, J. A. S. B. lvii, n. spp.

Oliarus cinnamomeus, Vancouver, PROVANCHER, Faune Can. Hem. p. 223, n. sp.

Ormenis biskrensis, Algeria, LETHIERRY, Rev. d'Ent. viii, p. 316, n. sp.

Polydictya affinis, Sikkim, ATKINSON, J. A. S. B. lvii, p. 339, n. sp.

CERCOPIDÆ, MEMBRACIDÆ.

Archasia canadensis, N. America, PROVANCHER, Faune Can. Hem. p. 230, n. sp.

Carynotus picta, Canada, PROVANCHER, Faune Can. Hem. p. 246, n. sp.

Cosmoscarta undata, n. varr. *tripunctata*, *affinis*, p. 333, *octopunctata* figured and noticed, p. 334, *decisa*, var. figured, pl. xv; ATKINSON, J. A. S. B. lvii.

C. nigrofusciata, Sikkim, *taprobanensis*, p. 333, *greeni*, p. 334, Ceylon, *nigra*, *sikkimensis*, *minor*, Sikkim, *lurida*, Singapore, p. 335, ATKINSON, J. A. S. B. lvii, n. spp.

Cyrtosia ornata, Ottawa, PROVANCHER, Faune Can. Hem. p. 240, n. sp.

Embolonia, n. g. (*Cercopidæ*), p. 253, for *E. tricarinata*, Canada, p. 254; PROVANCHER, Faune Can. Hem.

Platycotis nigromaculata, Vancouver, PROVANCHER, Faune Can. Hem. p. 251, n. sp.

JASSIDÆ.

Acocephalus nervosus, note on habits; DOUGLAS, Ent. M. M. xxv, p. 435.

A. circumflexus, Canada, PROVANCHER, Faune Can. Hem. p. 282, n. sp.

Cicadellina sp., parasites of; TETENS, Ent. Nachr. xv, pp. 1-3.

Deltocephalus alboniger, p. 81, *marginivalvis*, p. 82, Irkutsk, LETHIERRY, Rev. d'Ent. viii, n. spp.

Eurymeloides, n. g., *Bythoscopidæ* (no species); ASHMEAD, Ent. Am. v, p. 126.

Gypona hullensis, Canada, PROVANCHER, Faune Can. Hem. p. 269, n. sp. *Idiocerus niveo-sparsus*, *atkinsoni*, *clypealis*, Calcutta, LETHIERRY, P. A. S. B. 1889, p. 160, and J. A. S. B. lviii, p. 252; *I. duzei*, Canada, PROVANCHER, Faune Can. Hem. p. 290 : n. spp.

Pediopsis occidentalis, California, DUZEE, Psyche, v, p. 238; *P. basalis*, *ferrugineoides*, *insignis*, p. 171, *bifasciata*, p. 173, *punctifrons*, p. 174, N. America, DUZEE, Ent. Am. v : n. spp.

Platymetopius magdalensis, Canada, PROVANCHER, Faune Can. Hem. p. 275, n. sp.

Plesiommatus, n. g., p. 263, for *P. biunulata*, n. sp., Canada, p. 264; PROVANCHER, Faune Can. Hem.

Polydontoscelis, n. g., *Ilythoscopidæ* (no species); ASHMEAD, Ent. Am. v, p. 126.

Scophoideus auronitens, Canada, PROVANCHER, Faune Can. Hem. p. 277, n. sp.

Selenocephalus placidus, Canada, PROVANCHER, Faune Can. Hem. p. 280, n. sp.

Thamnotettix nigropicta, Stål, habits, characters of ♀; ATKINSON, J. A. S. B. lvii, p. 338.

T. desbrochersi, Algeria, LETHIERRY, Rev. d'Ent. viii, p. 318; *T. eburata*, Canada, DUZEE, Canad. Ent. xxi, p. 10; *T. decipiens*, Canada, PROVANCHER, Faune Can. Hem. p. 284 : n. spp.

Typhlocybini, notes on the N. American genera of; WOODWORTH, Psyche, v, pp. 211-214.

Typhlocyba rosæ (or rather *hippocastani* and *douglasi*, Edw.), destruction of by *Hymenopteron* and *Dipteron*; GIARD, (313, 315).

PSYLLIDÆ.

Psylla betule, larvæ noticed; KIEFFER, Ent. Nachr. xv, p. 222.

Trioza galii, larva noticed; KIEFFER, Ent. Nachr. xv, p. 223.

APHIDIDÆ.

[Cf. ASHMEAD (15), BLOCHMANN (85, 86), BUCKTON (1), CHOLONKOVSKY (141, 142, 143), DREYFUS (198, 199, 200, 201), GLASER (321, 322), KESSLER (439), LÖW (531), RÁTHAY (662), WEED (908, 911, 912), WESTHOFF (921), ZACHARIAS (947).]

Synoptic table of the genera : ASHMEAD, Ent. Am. v, pp. 185-187.

Ravages of various *Aphididæ* in N. America; LINTNER, Rep. N. Y. Mus. xl, pp. 112-128.

Aphis forbesi, Ohio, WEED, p. 273, Psyche, v, and (908), p. 148, pl. i. figs. 4 & 5, n. sp.

Chaitophorus aceris, observations on life-history : GLASER, Ent. Nachr. xv, pp. 40-46.

Chermes, observations on various species or forms, with reference to the cycle of development; DREYFUS, Zool. Anz. xii, pp. 65-73, 293, & 294, also (201) & (200); ZACHARIAS (947): farther observations with

reference to those of Blochmann & Dreyfus ; CHOLODKOVSKY, Zool. Anz. xii, pp. 218-223. *C. abietis*, observations on ; LÖW, Zool. Anz. xii, pp. 293-293 : the migrations of ; BLOCHMANN (85) : developmental cycle ; BLOCHMANN (85). *C. oblectus*, the name to fall ; DREYFUS, Biol. Centralbl. ix, p. 370. *C. oblectus*, *viridis*, *abietis*, biological notes on ; CHOLODKOVSKY, Zool. Anz. xii, pp. 60-64. *C. strobis* and others, observations on, with *C. sibiricus* and *lapponicus*, new names for forms that are probably not species but forms of *C. strobilobius* ; CHOLODKOVSKY, Zool. Anz. xii, pp. 387-391.

Melanoxanthus salicti (sic), Har., autumn life-history ; WEED, Psyche, v, p. 208.

Myzus ribis, L., autumn life-history ; WEED, Psyche, v, p. 210.

Pemphigus coccus, Afghanistan, BUCKTON, Tr. L. S. (2) v, p. 142, n. sp.

Phorodon humuli, economic notes on ; RILEY, Rep. 1888, pp. 93-111, pls. ii, iii, iv, & vii.

Phyllozera : discussion on the developmental cycle of *P. vastatrix*, with suggestion of a new species, *P. rutila* ; DREYFUS, Zool. Anz. xii, pp. 91-99. *P.*, biological notes on ; *P. pemphigoides*, Donnadieu, discussed ; RATHAY (662).

Schizoneura lanigera, its injurious nature discussed ; KESSLER (439).

S. corni, Fab., and *panicola*, Thos., are one species ; OSBORN, Ins. Life, ii, p. 108.

S. grossulariæ, TASCHENBERG-SCHÜLE, Ver.-blatt deutsch. Pomologen-Vereins, 1887, p. 86 (cf. Ent. Nachr. xv, p. 47), n. sp.

COCCIDÆ and ALEURODIDÆ.

[Cf. ATKINSON (17, 19), COQUILLETT (158), DOUGLAS (196), GREEN (335), HOWARD (405), LEWIS (516, 518), MACINTIRE (541, 542, 543, 544), MASKELL (554, 555), MORGAN (593), TRYON (871).]

Caudal segments and their appendages, morphology and functions ; MORGAN, Ent. M. M. xxv, pp. 189-196, pl. iii : anal tubercles ; *id.* p. 275, pl. iv.

Aleurodes : systematic position discussed ; WESTHOFF, J. Ber. westf. Ver. 1886, p. 56. *A. ribium*, Dougl., is probably *vaccinii*, Künow ; DOUGLAS, p. 256, Ent. M. M. xxv.

A. xylostei, Westphalia, WESTHOFF, J. Ber. westf. Ver. 1886, p. 61, n. sp.

Lecunidineæ, *Hemicoccidineæ*, and *Coccidineæ* ; MASKELL (554).

Aspidiotus personatus, note on, p. 23, fig., pl. i, fig. 1 ; MACINTIRE, J. Quek. Club (2) iv. *A. ostreaformis*, Curt., characters of ; MORGAN, Ent. M. M. xxv, p. 350. *A. uva*, notes on ; MURTFELDT, Riley Rep. 1888, p. 135.

A. eucalypti, S. Australia, MASKELL, Tr. R. Soc. S. Austr. xi, p. 102, pl. xii, fig. 1 ; *A. articulatus*, figs. 3 & 5, *longispina*, fig. 1, *dictyospermi*, fig. 2, Demerara, p. 352, *acaciæ*, Tasmania or Portugal, p. 353, pl. v. MORGAN, Ent. M. M. xxv : n. spp.

Curteria mexicana, note on ; HAGEN, Psyche, v, p. 168.

Ceroplastes, sp., on *Adiantum peruvianum* noticed, p. 23, figured, pl. i, figs. 3 & 4 ; MACINTIRE, J. Quek. Club (2) iv.

- Chionaspis fraxini*, Sign., ♂ noticed ; NEWSTEAD, Ent. M. M. xxv, p. 436.
- C. assimilis*, S. Australia, MASKELL, Tr. R. Soc. S. Austr. xi, p. 102, pl. xii, fig. 2, n. sp.
- Coccus cacti*, habitat noticed ; COCKERELL, Ent. M. M. xxv, p. 382.
- Dactylopius atlonidum*, description, synonymy, habits ; DOUGLAS, Ent. M. M. xxv, pp. 314-317.
- D. theobromæ*, gardens, London, DOUGLAS, Ent. M. M. xxv, p. 317 ; *D. ryani*, *cravii*, N. America, COQUILLETT, West. Am. Scientist, vi, p. 122 : n. spp.
- Diaspis*, scale of : ♂ noticed and figured ; MACINTIRE, J. Quek. Club (2) iii, p. 353, pl. xxvi, fig. 1.
- D. amygdali*, Australia, TRYON, (871) p. 89, n. sp.
- Eriococcus paradoxus*, S. Australia, MASKELL, Tr. R. Soc. S. Austr. xi, p. 104, pl. xiii, fig. 4, n. sp.
- Gossyparia ulmi*, in N. America, metamorphoses ; HOWARD, Ins. Life, ii, pp. 34-41, woodcuts.
- Hemicoccidinae*, Maskell, validity of the subfamily discussed ; MORGAN, Ent. M. M. xxv, p. 275.
- Icerya purchasi*, ♂ noticed, p. 29, figured, pl. i, fig. 6 ; LEWIS, J. Quek. Club (2) iv : larval state noticed, p. 358, figured, pl. xxvii, fig. 2 ; LEWIS, J. Quek. Club (2) iii : its original home, food-plants, enemies, and parasites ; RILEY, Rep. 1888, pp. 80-93, pls. viii-xi : in Natal, notes on ; DOUGLAS, Ent. M. M. xxv, pp. 232 & 257.
- Ischnaspis filiformis*, habitat, figure ; MACINTIRE, p. 353, pl. xxvi, fig. 3.
- Lecanium acuminatum*, notes on this and other *Coccidæ* injurious in India ; ATKINSON, Ind. Mus. Notes, i, pp. 6-8. *L. acuminatum*, scales noticed, pp. 315-317, figured, pl. xxvi, figs. 7 & 8 ; MACINTIRE, J. Quek. Club (2) iii, but this is said, *op. cit.* iv, p. 22, to refer to *mangiferae*, Green.
- L. viride*, p. 248, *mangiferae*, p. 249, Ceylon, GREEN, Ent. M. M. xxv, n. spp.
- Monophlebus*, generic characters of ♀ ; MASKELL, Tr. R. Soc. S. Austr. xi, p. 107.
- M. crawfordi*, S. Australia, MASKELL, Tr. R. Soc. S. Austr. xi, p. 108, pl. xiv, fig. 6, n. sp.
- Mytilaspis pomorum*, notes on ; LINTNER, Fourth Report, pp. 114-120.
- Orthezia insignis*, Dougl., its diffusion in England ; DOUGLAS, Ent. M. M. xxv, p. 271.
- Ortonia natalensis*, notes on ; DOUGLAS, p. 232, Ent. M. M. xxv : larval condition noticed, p. 356, figured, pl. xxvii, figs. 1 & 3 ; LEWIS, J. Quek. Club (2) iii.
- Planchonia fimbriata*, noticed, p. 24, figured pl. i, fig. 5 ; MACINTIRE, J. Quek. Club (2) iv.
- Pseudopulvinaria*, n. g. (*Hemicoccina*), for *P. sikkimensis*, n. sp., N. India ; ATKINSON, J. A. S. B. lviii, p. 2, pl. i.
- Pulvinaria flavicans*, S. Australia, MASKELL, Tr. R. Soc. S. Austr. xi, p. 103, pl. xii, fig. 3, n. sp.
- Ripersia leptospermi*, Australia, MASKELL, Tr. R. Soc. S. Austr. xi, p. 106, pl. xiv, fig. 5, n. sp.
- Vinsonia stellifera*, figure ; MACINTIRE, J. Quek. Club (2) iii, pl. xxvi, figs. 5 & 6.

(F). *NEUROPTERA*.

[*Cf.* FISCHER-SIGWART (266), MACLACHLAN (545).]

Catalogue of the *Neuroptera* of Ireland, with localities ; reviewed, Ent. M. M. xxv, p. 327.—Catalogue of the *Neuroptera* of the Netherlands ; ALBARDÀ (2).—Structure of epipharynx in *Neuroptera* ; PACKARD (621).—Embryology ; GRABER (329).

TRICHOPTERA.

[*Cf.* KLAČÁLEK (456, 458), RIS (722).]

Food of larvæ of *Trichoptera* ; LEVI-MORENOS (509).

Some *Trichoptera* found in Iceland ; MACLACHLAN, Ent. pp. 421–423.

Complete list of synonymy of Kolenati's *Trichoptera* ; KLAČÁLEK. List of *Trichoptera* of Switzerland ; RIS (722), including habits, and the number of generations in a year, and a series of observations on systematic characters.

Agrypnia pagetana, habits of ; MORTON, Ent. M. M. xxv, p. 456. *Apatania muliebris*, metamorphoses and parthenogenesis ; (456).

Brachycentrus subnubilus, habits noticed ; BOYD, Ent. M. M.

Chimarra, taxonomical note ; MORTON, Ent. M. M. xxv, p.

Mystacides sp. and *Neophylax*, embryology ; GRABER, pp. 1 viii, figs. 55–57, Denk. Ak. Wien, lv.

Stenophylax stellatus and *latipennis*, characters of ; MORTON & MACLACHLAN, Ent. M. M. xxv, pp. 235 & 236.

NEUROPTERA-PLANIPENNIA.

[*Cf.* BRAUER (97, 98), KARSCH (425), MEINERT (561), PACKARD (621).]

Corydalid cornutus, L., structure of epipharynx ; PACKARD, *Psyche*, v, p. 224.

Chauliodes rastricornis, metamorphoses ; WEED, Bull. Ohio Exp. Station, i. pp. 7-10, pl. i, fig. 3. *C. maculatus*, Ramb., structure of epipharynx ; PACKARD, *Psyche*, v, p. 224.

Myrmeleonidæ.

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Psychopsis zebra, Centr. Africa, BRAUER, Ann. Hofmuseum Wien, iv, p. 102, Notiz, n. sp.

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Thermophila furnorum, ROV., description, figure, and structural details; OUDEMANS, *Tijdschr. Ent.* xxxii, pp. 425-432, pl. xii : abdominal appendages of ; OUDEMANS, *Zool. Anz.* xii, pp. 353-355.
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Fossil *Perlida*, see BRAUER, REDTENBACHER, & GANGLBAUER (98), Palæontology, p. 82.

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Migration of swarm of *Ephemeridæ* ; CALLONI, Bull. Ent. Ital. xxi, pp. 39-43.

Ephemera natata, great swarms of ; LINTNER, Fourth Rep. pp. 121-124. *E. (Leptophlebia) cupida*, duration of life of ; PACKARD, Psyche, v, p. 168.

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- Libellula quadrimaculata*, migratory swarm of ; GIARD (312) : swarm of at Heligoland ; CORDEAUX, Ent. xxii, p. 189 : migratory swarm of ; HALL, Ent. M. M. xxv, p. 324. *L. cancellata*, premature appearance of ; MARCHAL, Bull. Soc. Saone, iv, p. 144. *L. depressa*, description of transformation ; FISCHER-SIGWART, MT. Aargau Ges. v, pp. 155-157.
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Æschna heros, Fab., structure of epipharynx; PACKARD, Psyche, v, p. 223: figure of split wings of; HAGEN, Zool. Anz. xii, p. 378, pl. *Æ. borealis*, Zett., ♂ appendages; McLACHLAN, Ent. M. M. xxv, p. 272.

Gomphæschna, tabulation of genera allied to; KARSCH, Ent. Nachr. xv, p. 238.

Jagoria, n. g., p. 238, for *J. pæcilopectera*, n. sp., Philippines, p. 238; KARSCH, Ent. Nachr. xv.

Triacanthagyna dirupta, Timor, KARSCH, Ent. Nachr. xv, p. 236, n. sp.

Agrioninæ.

Calopteryx, synopsis of N. American species; HAGEN, Psyche, v, pp. 241-250.

C. amata, p. 244, *C. æquabilis*, race *yakima*, p. 248, N. America, HAGEN, Psyche, v, n. spp. (sic).

Lestes wallacei, Sarawak, KIRBY, P. Z. S. 1889, p. 302, n. sp.

Sapho, characters of the species; KARSCH, Ent. Nachr. xv, p. 234.

S. venusta, Africa, KARSCH, Ent. Nachr. xv, p. 233; *S. pulchella*, Cameroons, KIRBY, P. Z. S. 1889, p. 300: n. spp.

Palaophlebia, n. g. and nov. legio, p. clv, for *P. superstes*, n. sp., Japan; SELYS, p. clvi, pl. ii, figs. 1-14, C.R. ent. Belg. xxxiii.

Agrion puella, copulation and oviposition of; FISCHER-SIGWART, MT. Aargau Ges. v, p. 142.

Ischnura maroccana, Kolbe, queried; McLACHLAN, Ent. M. M. xxv, p. 349.

Protosticta gracilis, Celebes, KIRBY, P. Z. S. 1889, p. 302, n. sp.

Tutocnemis, n. g., p. 300, for *T. malgassica*, n. sp., Betsileo, p. 301, woodcut; KIRBY, P. Z. S. 1889.

Pronerra, n. g., p. clxxii, for *P. prolongata*, n. sp., Amazons, p. clxxiv; SELYS, C.R. ent. Belg. xxxiii.

(G.) ORTHOPTERA.

[*Cf.* BOLIVAR (98, 99), BOUTAN (95), BRAUER (98), BROGNIART (104), BROWN (106), BRUNER (107), BRUNNER (109), CHOLODKOVSKY (140), COLENZO (152), COTES (165), DAVIS (176), HAASE (349, 350), HALL (357), KARFCH (428), KIRBY (450, 451), KIRK (454), KÜNCKEL (477), MACNEIL (547), MAZZONI (559), MILLER (577), PACKARD (619, 621), PICTET (630), REDTENBACHER (665), RETOWSKI (702), SAUSSURE (758), SHAW (810), WESTWOOD (922), WHEELER (923), WOOD-MASON (935, 936, 937).]

Embryology ; GRABER (329).

FORFICULIDÆ.

Forficulidæ of Britain ; SHAW, Ent. M. M. xxv, pp. 355-359.

Forficula, structure of epipharynx in ; PACKARD, Psyche, v, p. 193.

Fossil *Dermapteron*, see BRAUER (98), and Palæontomology, p. 82.

Sphingolabis, n. g. ; BORMANS, Ann. Ent. Belg. xxvii, pt. ii, table opposite p. 58.

BLATTIDÆ.

Blattidæ of Britain ; SHAW, Ent. M. M. xxv, pp. 365-372.

Heterogamia pellucida, Turcomania, REDTENBACHER, p. 25, Wien. ent. Z. viii, n. sp.

Fossil *Blattidæ*, see BRAUER, REDTENBACHER, & GANGLBAUER (98), and SCUDDER (787).

Distinction between carboniferous and living *Blattidæ* ; BROGNIART (104).

Embryology and schematic structure of *Blattidæ* ; HAASE (349, 350).

Phyllotromia germanica, dorsal pouch noticed ; HAASE, Zool. Anz. xii, pp. 171 & 172.

Blatta, structure of epipharynx in ; PACKARD, Psyche, v, p. 196. *B. germanica*, embryology ; WHEELER (923), CHOLODKOVSKY (140). *B. orientalis* and *germanica*, distribution of in Asiatic Russia ; GRÄFE, Soc. Ent. iv, p. 81.

Periplaneta orientalis, stink-gland ; HAASE, Zool. Anz. xii, pp. 169-171 : structure of hypodermis ; MINGAZZINI (581).

Deropeltis paulinoi, ♀ described ; BOLIVAR, J. Sci. Lisb. (2) i, p. 76.

Gyna nigrifrons, Trop. Africa, BOLIVAR, J. Sci. Lisb. (2) i, p. 77, n. sp.

Panchloru cupelloi, Quango, BOLIVAR, J. Sci. Lisb. (2) i, p. 78, n. sp.

Derocalymma serper, fig. 1, Angola, *silphoides*, Quango, BOLIVAR, J. Sci. Lisb. (2) i, p. 79, n. spp.

MANTIDE.

Fossil *Mantodea*; see BRAUER, REDTENBACHER, & GANGLBAUER (98), and Palaeoentomology, p. 82.

Acanthops angulifera, Brazil, WESTWOOD, p. 45, pl. xiii, fig. 1, Rev. Mant.; *A. contorta*, p. 56, *adusta*, p. 57, Amazons, GERSTAECKER, MT. Vorpomm. xx : n. spp.

Acontista (p. 22, *Acontistes*, p. 45) *truncata*, figured, pl. ix, fig. 3 ♂, fig. 2 ♀; WESTWOOD, Rev. Mant.

A. semirufa, Amazonia, WESTWOOD, p. 45, pl. ix, fig. 2, Rev. Mant.; *A. amanula*, Amazons, GERSTAECKER, p. 51, MT. Vorpomm. xx : n. spp.

Acromantis aruana, Aru I., pl. xi, fig. 3, *subcornuta*, Natal, pl. xii, fig. 3, *parvula*, Sarawak, pl. x, fig. 6, *japonica*, WESTWOOD, p. 43, Rev. Mant., n. spp.

Æthallochroa, W.-M., described at length, pp. 310 & 311; WOOD-MASON, J. A. S. B. lviii. *Æ. ashmoliana*, figured, pl. xii, fig. 6; WESTWOOD, Rev. Mant.

Æ. affinis, *spinipes*, Sind, p. 313, WOOD-MASON, J. A. S. B. lviii, n. spp. *Ambivia popa*, figured, pl. xi, fig. 6; WESTWOOD, Rev. Mant.

Amorphoscelis, diagnosis emended, *A. annulicornis*, habits noticed; WOOD-MASON, Cat. Mant. p. 4.

A. costalis, New Guinea, *pellucida*, Adelaide, WESTWOOD, p. 28, Rev. Mant., n. spp.

Anastira, n. g., for *Mantis diana*, Stoll.; GERSTAECKER, MT. Vorpomm. xiv, p. 97.

Angela versicolor, pl. iii, fig. 2 ♂, fig. 3 ♀, figured; WESTWOOD, Rev. Mant.

A. perpulchra, Nicaragua, WESTWOOD, p. 30, Rev. Mant., n. sp.

Archimantis monstrosa, figured, pl. iii, fig. 1; WESTWOOD, Rev. Mant.

Cardioptera vitrea, figured, pl. iv, fig. 7; WESTWOOD, Rev. Mant.

Ceratocrania, n. g., for *C. macra*, n. sp., Sarawak, pl. xi, fig. 9; WESTWOOD, p. 46, Rev. Mant.

Chatessa caudata, figured, pl. xiv, fig. 1; WESTWOOD, Rev. Mant.

Chiropus dives, figured, pl. xiv, fig. 15; WESTWOOD, Rev. Mant.

Cheradodis, brief characters of species of, and woodcuts; WOOD-MASON, pp. 12-19, Cat. Mant. *C. strumaria*, pl. viii, fig. 1, *rhombicollis*, Latr., pl. vii, figs. 3 & 4, *laticollis*, pl. viii, fig. 2, *rhomboidea*, pl. vii, fig. 1, *caecellata*, pl. vii, fig. 6, *squilla*, pl. vii, figs. 2 & 5, figured; WESTWOOD, Rev. Mant.

Compsothespis australiensis, figured, pl. xii, fig. 11; WESTWOOD, Rev. Mant.

C. natalica, S. Africa, WESTWOOD, p. 32, Rev. Mant.; *C. australiensis*, Australia, WOOD-MASON, p. 7, Cat. Mant. : n. spp.

Coptopteryx argentina, pl. xii, fig. 2 ♂, fig. 10 ♀, figured; WESTWOOD, Rev. Mant.

Creobroter cattulus, Java, WESTWOOD, p. 42, pl. ix, fig. 10, Rev. Mant., n. sp.

Danuria, monograph of; KARSCH, Ent. Nachr. xv, pp. 270-275.

D. serratodentata, Malange, *impannosa*, Nubia, KARSCH, p. 274, Ent.

Nachr. xv ; *D. barboza*, Pungo Andongo, BOLIVAR, J. Sci. Lisb. (2) i, p. 85 ; *D. (?) caffra*, Kilimanjaro, WESTWOOD, p. 42, pl. i, fig. 5 : n. spp.

Danuriella, n. g., for *D. irregularis*, n. sp., Madagascar, pl. i, fig. 9 ; WESTWOOD, p. 42, Rev. Mant.

Deroplutys siccifolium, pl. ix, fig. 11, *truncata*, pl. viii, fig. 6, figured ; WESTWOOD, Rev. Mant.

D. horripica, pl. viii, fig. 4, *trigonodera*, fig. 5, Burmah, *sarawaca*, Borneo, fig. 3 ; WESTWOOD, p. 40, Rev. Mant., n. spp.

Didymocorypha ensifera, woodcuts of head of ; WOOD-MASON, p. 34, Cat. Mant.

Dysaules himalayanus, N. India, WOOD-MASON, pp. 42 & 43, woodcuts, Cat. Mant., n. sp.

Dystacta alticeps, ♀ = (*Chroicoptera vidua*, Stål), figured, pl. ix, fig. 8 ; WESTWOOD, Rev. Mant.

Enicophlebia, n. g., for *E. pallida*, Madagascar, n. sp., pl. i, fig. 10 ; WESTWOOD, p. 39, Rev. Mant.

Epaphrodita musarum, figured, pl. xi, fig. 10 ♂, fig. 4 ♀ ; WESTWOOD, Rev. Mant.

E. basilaris, Madagascar, WESTWOOD, p. 45, pl. i, fig. 2, Rev. Mant., n. sp.

Episcopus chalybeus, description of ♀, and outline of head ; WOOD-MASON, p. 39, Cat. Mant. : figured, pl. xi, fig. 11 ; WESTWOOD, Rev. Mant.

Eremiaphila typhon, pl. xiv, fig. 11, figured ; WESTWOOD, Rev. Mant.

E. turcica, Turkey, p. 29, pl. xiv, fig. 2 ; WESTWOOD, Rev. Mant., n. sp.

Eremoplana guerinii, figured, pl. ii, fig. 5 ; WESTWOOD, Rev. Mant.

E. microptera, India, WESTWOOD, p. 32, pl. xi, fig. 5, n. sp.

Euchomena stanleyana, Gaboon, WESTWOOD, p. 33, Rev. Mant., n. sp.

Euthyphleps, n. g., p. 315, for *E. rectivenis*, n. sp., Kulu, Kangra, p. 317 ; WOOD-MASON, J. A. S. B. lviii.

Galinthias amena, figured, pl. x, fig. 3 ♂, fig. 10 ♀ ; WESTWOOD, Rev. Mant.

Gonatista ornata, figured, pl. xiii, fig. 7 ; WESTWOOD, Rev. Mant.

Gonypeta malayana, Batchian, pl. xiii, fig. 9, *debilitata*, Natal, pl. xiv, fig. 12, WESTWOOD, p. 37, Rev. Mant., n. spp.

Hapalomantis semirufula, Sarawak, pl. xiii, fig. 8 ♂, pl. i, fig. 1 ♀, *fuliginosa*, Aru I., pl. xiii, fig. 6, WESTWOOD, p. 37, Rev. Mant., n. spp.

Hapalopeza occipitalis, China, pl. xiii, fig. 5, *tigrina*, Singapore, pl. xiv, fig. 13, WESTWOOD, pp. 36 & 37, Rev. Mant., n. spp.

Hestiasula (cf. p. 22) *inermis*, figured, pl. ix, fig. 12 ; WESTWOOD, Rev. Mant.

H. sarawaca, Borneo, WESTWOOD, p. 44, pl. xi, fig. 1, Rev. Mant., n. sp.

Heterochetula, n. g., p. 308, for *Heterochæta tricolor*, W.-M., and *H. fissipennis*, n. sp., E. India, p. 309 ; WOOD-MASON, J. A. S. B. lviii.

Hierodula simulacrum, pl. iv, fig. 2, pl. vi, fig. 5, *bipapilla*, pl. 5, fig. 2, *patellifera*, ? Serv., pl. iv, fig. 5, *coarctata*, pl. iv, fig. 1, figured ; WESTWOOD, Rev. Mant.

H. scutula, Angola, BOLIVAR, J. Sci. Lisb. (2) i, p. 83 ; *H. dyaka*, Borneo, pl. vi, fig. 4, *heterodera*, India, *acutipennis*, Madagascar, pl. i,

fig. 8, p. 34, *aruana*, pl. iv, fig. 4, *Aru I.*, *harpyia*, Ceylon, pl. v, fig. 3, p. 35, WESTWOOD, Rev. Mant. : n. spp.

Humbertiella ceylonica, ♀, pl. ii, fig. 1, *indica*, fig. 5, figured; WESTWOOD, Rev. Mant.

H. (on p. 4, but *Theopompa* on p. 29) *disparilis*, Borneo, p. 29, pl. iii, fig. 2 ♂, fig. 3 ♀, WESTWOOD, Rev. Mant., n. sp.

Idolomorpha madagascariensis, Madagascar, WESTWOOD, p. 46, pl. vi, fig. 9, Rev. Mant., n. sp.

Idolum diabolicum figured, pl. v, fig. 1; WESTWOOD, Rev. Mant.

Iris masoni, India, WESTWOOD, p. 32, pl. i, fig. 6, Rev. Mant., n. sp.

Ischnomantis fatiloqua, Stål, ♀ described; BOLIVAR, J. Sci. Lib. (2) i, p. 82.

Liturgousa annulipes figured, pl. ii, fig. 3; WESTWOOD, Rev. Mant.

L. mesopoda, Guiana, p. 30, pl. xiii, fig. 10, WESTWOOD, Rev. Mant., n. sp.

Liturgusa lichenalis, p. 52, *superba*, p. 53, *nubeculosa*, p. 54, Upper Amazons, GERSTAECKER, MT. Vorpomm. xx, n. spp.

Lygdania capitata, ♂ pl. xiv, fig. 7, ♀ fig. 6, figured; WESTWOOD, Rev. Mant. *L. lenticularis* and *capitata*, woodcuts of heads; WOOD-MASON, pp. 35 & 36, Cat. Mant.

Mantellias, n. g., p. 38, for *M. pubicornis*, n. sp., S. America, p. 39; WESTWOOD, Rev. Mant.

Mantillica, n. g., for *M. nigricans*, pl. xiv, fig. 16, *sialideus*, n. spp., Amazons; WESTWOOD, p. 39, Rev. Mant.

Mantis carolina, notes on; LINTNER, Fourth Rep. pp. 158-162.

M. octospilota, Adelaide, WESTWOOD, p. 35, Rev. Mant., n. sp.

Mantoida fulgidipennis, Para, pl. xiv, fig. 9, *luteola*, Brazil, fig. xiv, p. 28, WESTWOOD, Rev. Mant., n. spp.

Metallyticus semianeus, Borneo, pl. xiv, fig. 3, p. 28, WESTWOOD, Rev. Mant., n. sp.

Metilia integra figured, pl. ix, fig. 9; WESTWOOD, Rev. Mant.

Miomantis savignii figured, pl. x, fig. 1; WESTWOOD, Rev. Mant.

Miopteryx perla, Java, *grandis*, Brazil?, *iridipennis*, India, *mirandula*, Sumatra, WESTWOOD, p. 38, Rev. Mant., n. spp.

Musonia variipennis, Dorey, *gilolæ*, Gilolo, *fragilis*, p. 31, *bilineata*, Borneo, p. 32, WESTWOOD, Rev. Mant., n. spp.

Myrcinus tuberosus figured, pl. ii, fig. 2; WESTWOOD, Rev. Mant.

Nanomantis biseriata, Rockhampton, WESTWOOD, p. 32, Rev. Mant., n. sp.

Orthodera burmeisteri, New Guinea, WOOD-MASON, p. 21, Cat. Mant., n. sp.

Oxyophthalmus engæus, S. India, WOOD-MASON, p. 37, woodcut, Cat. Mant., n. sp.

Oxyops rubicunda figured, pl. vi, fig. 3; WESTWOOD, Rev. Mant.

Orypilus capensis figured, pls. ix, fig. 7 ♂, & xii, fig. 1 ♀; WESTWOOD, Rev. Mant.

O. vigilax, Brazil, WESTWOOD, p. 44, pl. x, fig. 8, Rev. Mant., n. sp.

Parastagmoptera flavoguttata figured, pl. vi, fig. 1; WESTWOOD, Rev. Mant.

Paratoxodera, n. g. (*Validæ*), p. 324, for *P. cornicollis*, n. sp., Java, p. 325; WOOD-MASON, J. A. S. B. lviii.

Parepiscopus, n. g. near *Episcopus*, p. 39, for *P. hamptoni*, n. sp., S. India, p. 40, woodcut; WOOD-MASON, Cat. Mant.

Parorypilus kraussii, ♂ described; WOOD-MASON, Cat. Mant. p. 2.

Phasmomantis basalis, India, WESTWOOD, p. 33, pl. xiii, fig. 4, Rev. Mant., n. sp.

Phyllocrania insignis figured, pl. xii, fig. 7; WESTWOOD, Rev. Mant.

Phyllothelis westwoodi figured, pls. i, fig. 3 ♂, & vi, fig. 6 ♀; WESTWOOD, Rev. Mant.

Phyllothelys taprobane, Ceylon, p. 366, *maluyae*, Perak, p. 367, WOOD-MASON, Ann. N. H. (6) iv, n. spp.

Platycolymma, n. g., p. 39, for *P. latipennis*, pl. x, fig. 7, *madagascariensis*, Madagascar, n. spp., p. 40; WESTWOOD, Rev. Mant.

Polyspilota rutilidissima, pl. x, fig. 4 ♂, fig. 5 ♀, figured; WESTWOOD, Rev. Mant.

P. calabarica, Old Calabar, pl. xi, fig. 2, *caffra*, Caffraria, pl. xi, fig. 7, WESTWOOD, p. 35, Rev. Mant., n. spp.

Popa spurea, Stål, ♀ described; BOLIVAR, J. Sci. Lisb. (2) i, p. 85.

Pseudomantis victorina, N. Australia, WESTWOOD, p. 36, pl. ix, fig. 6, Rev. Mant., n. sp.

Pyrgomantis singularis, Gerst., ♂ pl. xiv, fig. 4, ♀ fig. 5, figured; WESTWOOD, Rev. Mant. *P. nasuta*, woodcuts of head; WOOD-MASON, p. 33, Cat. Mant.

Rhombodera basalis, pl. v, fig. 3 ♂, fig. 4 ♀, figured; WESTWOOD, Rev. Mant.

R. pectoralis, Papua, pl. i, fig. 7, *basalis*, Borneo, pl. v, fig. 4, WESTWOOD, p. 33, Rev. Mant., n. spp.

Schizocephala bicornis, notes on, with woodcut; WOOD-MASON, p. 45, Cat. Mant.

Sibylla ? *polycantha*, Congo, GERSTAECKER, p. 49, MT. Vorpomm. xx, n. sp.

Sigerpe tridens, figured, pl. xii, fig. 8; WESTWOOD, Rev. Mant.

Sphodropoda tristis, figured, pl. x, fig. 9 ♂, fig. 2 ♀; WESTWOOD, Rev. Mant.

S. medioconstricta, hab. ? p. 35, pl. xii, fig. 4, WESTWOOD, Rev. Mant., n. sp.

Stagmomantis domingensis, figured, pls. iv, fig. 3, & xii, fig. 3; WESTWOOD, Rev. Mant.

Stigmatoptera prædicatoria, figured, pl. iv, fig. 6; WESTWOOD, Rev. Mant.

S. perpulchra, Amazons, WESTWOOD, p. 30, pl. xi, fig. 8, Rev. Mant., n. sp.

Tarachodes lucubrans, Burch., pl. vi, fig. 2, *irrorata*, Gerst., pl. xiv, fig. 8, figured; WESTWOOD, Rev. Mant. *T. insidiator*, p. 28, *dissimulator*, pp. 29 & 30, woodcuts, full characters of ♂; WOOD-MASON, Cat. Mant.

Theoclytus amazonicus, Brazil, WESTWOOD, p. 46, Rev. Mant., n. sp.

Theopompa heterochroa, ♂ pl. ii, fig. 7, ♀ fig. 4, figured; WESTWOOD, Rev. Mant.

T. nigropicta, Australia, pl. ii, fig. 6, *cambodjiensis*, Cambodia, p. 29, WESTWOOD, Rev. Mant., n. spp.

Thespis dissimilis, Madras, p. 30, *disparilis*, Swan River, p. 31, WESTWOOD, Rev. Mant., n. spp.

Thesprolia filiformis, figured, pl. iii, fig. 6; WESTWOOD, Rev. Mant.

Toxodera denticulata, ♀ noticed; WOOD-MASON, J. A. S. B. lviii, p. 323.

T. orientalis, pl. xii, fig. 9, *curtipes*, pl. i, fig. 4, *fortnumi*, pl. viii, fig. 7, *pareula*, India, WESTWOOD, p. 41, Rev. Mant., n. spp.

Toxoderopsis, n. g., near *Toxodera*, p. 317, for *T. spinigera*, Bombay, p. 319, *taurus*, Sind, p. 320, n. spp.; WOOD-MASON, J. A. S. B. lviii.

Vatide, synonymical list of the Oriental and Ethiopian genera and species; WOOD-MASON (937).

Vates parvulus, Brazil, WESTWOOD, p. 46, Rev. Mant., n. sp.

PHASMATIDÆ.

Abrachia, n. g., p. 503, for *A. brevicollis*, n. sp., Brazil, p. 504; KIRBY, Ann. N. H. (6) iii, n. sp.

Bacillus angolensis, Africa, BOLIVAR, J. Sci. Lisb. (2) i, p. 89, n. sp.

Bactrododema miliaris, p. 87, *welwitschi*, p. 88, Trop. Africa, BOLIVAR, J. Sci. Lisb. (2) i, n. sp.

Diapheromera (?) *saussurii*, Dominica, KIRBY, p. 501, Ann. N. H. (6) iii, n. sp.

Gratidia bituberculata, Turcomania, REDTENBACHER, p. 26, Wien. ent. Z. viii, n. sp.

Phyllium siccifolium, in Paris; GUILLOT, Bull. Soc. Ent. Fr. (6) ix, p. exix. *P. pulcherfolium*, bred in France; BROGNIART, C.R. ent. Belg. xxxiii, p. xvi.

Promachus spinosus, p. 230, *insularis*, p. 231, Louisiade Archipelago, KIRBY, Ann. N. H. (6) iv, n. spp.

Pseudobacteria longiceps, Santa Lucia, KIRBY, Ann. N. H. (6) iii, p. 503, n. sp.

Pterinoxylus crassus, Dominica, KIRBY, p. 502, Ann. N. H. (6) iii, n. sp.

Spectrum bivittatum, Say, structure of epipharynx; PACKARD, Psyche, v, p. 197.

GRYLLIDÆ.

Arachnopsis annulipes, Philippines, BOLIVAR, An. Soc. Esp. xviii, p. 423, n. sp.

Ectotoderus cucullatus, Philippines, BOLIVAR, An. Soc. Esp. xviii, p. 421, n. sp.

Euscirtus maesoi, Philippines, BOLIVAR, An. Soc. Esp. xviii, p. 429, n. sp.

Gryllodes berthellus, Saus., ♂ described; BOLIVAR, An. Soc. Esp. xviii, p. 420.

Gryllotalpa vulgaris, in New Zealand; KIRK, Tr. N. Z. Inst. xxi, pp. 233-235: embryology; GRABER, pp. 133-138, pl. i, figs. 3-5, Denk. Ak. Wien, lv.

Gryllus sp., structure of epipharynx; PACKARD, Psyche, v, p. 199.

G. abbreviatus, and allies, notes on ; MACNEILL, Ent. Am. v, pp. 101, & 102.

Iebinthus, Stål, = (*Parthenopterus*, Sauss.); BOLIVAR, An. Soc. Esp. xviii, p. 425.

L. sanchezi, *saussurei*, Philippines, BOLIVAR, An. Soc. Esp. xviii, p. 425, n. sp.

Mnesilobus pallidulus, Philippines, BOLIVAR, An. Soc. Esp. xviii, p. 428, n. sp.

Nemobius tagalicus, p. 417, *luzonicus*, p. 418, Philippines, BOLIVAR, An. Soc. Esp. xviii, n. spp.

Ecanthus, notes on the N. American species ; MACNEILL, Ent. Am. v, pp. 102-104. *E. nireus* and *E. latipennis*, Riley, habits and food ; MURTFELDT, Ins. Life, ii, pp. 130-132: *Æ. nireus*, embryology ; GRABER, Denk. Ak. Wien, lv, pp. 133-138.

LOCUSTIDÆ.

Acanthoproctus capreolus, p. 69, pl. iii, figs. 33 & 33a, *ibex*, p. 72, figs. 31 & 31b, S. Africa, PICTET, Mém. Soc. Phys. Genève. xxx, No. 6, n. spp.

Agræcia pupus, p. 49, pl. ii, figs. 28 & 28a, *godeffroyi*, p. 50, figs. 29 & 29a, New Ireland, PICTET, Mém. Soc. Phys. Genève. xxx, No. 6, n. spp.

Anubrus simplex, Hald., structure of epipharynx ; PACKARD, Psyche, v, p. 198.

Apocerycta buriana, Cayenne, PICTET, Mém. Soc. Phys. Genève. xxx, No. 6, p. 10, pl. i, fig. 3, n. sp.

Aprosphyllus, n. g. (*Decticiens*), p. 65, for *A. hybridus*, n. sp., S. Africa, p. 67, pl. ii, fig. 22 ; PICTET, Mém. Soc. Phys. Genève. xxx, No. 6.

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ECHINODERMATA.

BY

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I.—LIST OF PUBLICATIONS.*

1. BARROIS, C. Faune du Calcaire d'Erbray (Loire Inf.). *Crinoidea*. Mém. Soc. Géol. Nord. Lille (4) xvii, p. 57.
2. BATHER, F. A. The Basals of *Eugeniocrinida*. Ann. N. H. iii, 1889, p. 439.
3. —. *Pentacrini* in Peculiar Beds of Great Oolite Age near Basle. *Op. cit.* iv, 1889, pp. 49-52, woodcut.
Supplementary description of *P. nicoleti*, var. *minus*, and *P. basilea* [See Greppin, Mém. Soc. Pal. Suisse, xv, 1888, pp. 133 & 134.]
4. —. *Trigonocrinus*, a New Genus of *Crinoidea*, from the "Weisser Jura" of Bavaria; with the Description of a New Species, *T. liratus*.—Appendix: Sudden Deviations from Normal Symmetry in *Neocrinoidea*. Q. J. Geol. Soc. xlv, i, pp. 149-171, pl. vi, 2 woodcuts.
The author discusses and illustrates by diagram (p. 165) the probable evolution of *Trigonocrinus*.
5. —. Note on *Marsupites testudinarius*, v. Schlotheim, sp. *T. c.* pp. 172-174.
A synonymy of *Marsupites* and of *M. testudinarius*, which includes all other names.
6. —. The Basals of *Eugeniocrinida*. *Op. cit.* ii, pp. 359-362, woodcut of 12 figs.
Confirms Zittel's account of *Eugeniocrinus caryophyllatus*.
7. BEACHLER, C. S. Notice of some new and remarkable forms of *Crinoidea* from the Niagara Limestone at S. Paul, Decatur County, Indiana. Am. Geol. iv, 1889, pp. 102 & 103.

* An asterisk prefixed to a quotation indicates that the Recorder has not seen the Journal or Work referred to.

8. BELL, F. J. Report on a Collection of Echinoderms made at Tuticorin, Madras, by Mr. Edgar Thurston. P. Z. S. 1888, pp. 383-389.

The collection contains 1 new *Oreaster*, 1 new *Pectinura*, 1 new Hemieuryalid (?). The paper concludes with a list of Echinoderm fauna from the Sea of Bengal.

9. —. Note on *Antedon pumila* and *A. incommoda*. Ann. N. H. iii, 1889, p. 292.

The first pinnule of *A. pumila* is longer than the second, and therefore *A. incommoda* does not exist as a separate species.

10. —. Note on a Remarkably Large Specimen of *Luidia* from the Island of Mauritius. T. c. p. 422.

11. —. Report of a Deep-Sea Trawling Cruise off the S.-W. Coast of Ireland, under the direction of Rev. W. Spotswood Green. *Echinodermata*. Op. cit. iv, 1889, pp. 432-445, pls. xviii & xix; also J. R. Micr. Soc. 1890, i, pp. 44 & 45.

The collection contains 2 Crinoids, 8 Asteroids, 1 Ophiuroid, 9 Echinoids, and 2 Holothuroids. Six specimens of *Phormosoma placenta* were dredged.

12. —. Note on the Relative Claims to Recognition of the Generic Names *Arbacia*, Gray, and *Echinocidaris*, Des Moulins. Ann. N. H. iii, 1889, p. 290.

Arbacia cannot be avoided.

13. BLEICHER, M. Découverte d'Oursin regulier dans le Lias moyen. Bull. Soc. Nancy (2) ix, 21, pp. xxii & xxiii.

Pseudodiadema minutum found in Middle Lias.

14. BOEHM, G. Ein Beitrag zur Kenntniss fossiler Ophiuren. Ber. Freiberg. Ges. iv, 5, pp. 232-287, pls. iv & v.

The paper consists of a geological and a palæontological portion: in the latter are discussed the general structure of Ophiurids, their systematic position (with special attention to *Acrourea* and *Aspidura*), and 4 new species. An amended definition of *Aspidura* is suggested.

15. BURY, H. Studies in the Embryology of the Echinoderms. Q. J. Micr. Sci. xxix, pp. 409-449, pls. xxxvii-xxxix; also J. R. Micr. Soc. 1889, 3, pp. 390 & 391.

The development of the earliest stages is not detailed, the "*Dipleurula*" larva forming the starting-point of the investigations. The author deals with (1) the primary divisions of the coelom, pp. 409-422, (2) the hydrocoel, pp. 422-432, (3) the skeleton, pp. 432-445, in Ophiurida, Echinida, Asterida, Crinoids, and Holothurians. A pair of anterior enterocoels was originally present in all. The water-pore always (?) arises in connection with the posterior end of the left anterior enterocoel. The hydrocoel arises on the left side as a derivative from one or other division of the coelom; it never has an external pore of its own. The present position of closure of the water-vascular ring is secondary in most groups. The terminal plates are developed round the left

enterocol. The inter-radius containing the mouth and anus may be called "ventral," or, preferably, since it contains the præoral lobe, "anterior."

16. CARPENTER, P. H. Report on the *Comatulæ* of the Morgui Archipelago, collected for the Trustees of the Indian Museum, Calcutta, by Dr. John Anderson. J. L. S. xxi, pp. 304-316, pls. xxvi & xxvii; also J. R. Micr. Soc. 1890, i, p. 45.

The collection includes 5 species of *Antedon* (1 new species) and 1 *Actinometra*, n. sp.; the latter and 3 *Antedons* were infested by a parasitic *Myxostoma*.

17. CHADWICK, H. C. Second Report on the *Echinodermata* of the L. M. B. C. District. P. Liverp. Biol. Soc. iii, 1889, pp. 174-180.

Total species are 35; 5 Astorids and 1 Holothurian are added to the fauna of the district.

18. COOPER, W. F. Tabulated List of Fossils known to occur in the Waverley of Ohio. *Crinoidea*. Bull. Denison Univ. iv, i, pp. 128 & 129.

19. COTTEAU, G. Échinides recueillis dans la Province d'Aragon (Espagne). Ann. Sci. Nat. viii, 1, pp. 1-60, pls. i-iv.

A description of the Cretaceous and Eocene Echinoids of the district.

20. —. Note sur un exemplaire du *Coraster vilanovæ* provenant de Thersakhan (Turkestan). Bull. Soc. géol. (3) xvii, 3, pp. 155 & 156.

21. —. Memoire sur les Échinides éocènes de la province d'Alicante. T. c. pp. 155-157.

22. —. Sur deux Echinodermes fossiles provenant de Thersakhan (Turkestan). C. R. cviii, pp. 327-329.

On *Austinocrinus komaroffi* [vide LORIOU (64)], and *Coraster vilanovæ* [vide COTTEAU (20)].

23. —. Note sur un nouveau genre d'Echinide vivant. Bull. Soc. Z. Fr. xiv, i, p. 15.

Brief description of *Rhabdобрissus*, n. g., with *R. jullieni*, n. sp.

24. —. Échinides Crétacés de Madagascar. Op. cit. v, pp. 87-89.

Description of 2 new fossil species—*Guettkuria rocardi* and *Lampodaster grandidieri*, n. g. & spp.

25. —. Échinides recueillis par M. Jullien sur les Côtes de Guinée. Op. cit. viii, pp. 340-342.

Description of a new species of *Schizaster*, and of *Echinolampas*.

26. —. Échinides nouveaux ou peu connus. Mém. Soc. Zool. Fr. ii, No. 4, pp. 321-332, pls. xiv & xv.

8 new species are described, belonging to the genera *Pseudodiadema*, *Rhabdocidaris*, *Goniopygus*, *Cassidulus*, *Gualteria*, *Cyclaster*, and *Parasalenia*.

27. DUNCAN, P. M., & SLADEN, W. P. Report on the *Echinoidea* of the Mergui Archipelago; collected for the Trustees of the India Museum, Calcutta, by Dr. J. Anderson. J. L. S. xxi, pp. 316-319; also J. R. Micr. Soc. 1890, i, pp. 45 & 46.

The collection consists of 6 species, 4 *Temnopleurida*, and 2 Clypeastroids.

28. DUNCAN, P. M. A revision of the Genera and Great Groups of the *Echinoidea*. J. L. S. xxiii, pp. 1-311.

The total genera number 255, subgenera 50, divisions 6; these include 12 new genera and 7 new subgenera. The following genera are considered superfluous, or synonyms of others:—

Genus *Palæocidaris*, *Perischocidaris*, *Echinocrinus*, *Protoechinus*, *Typhechinus*, *Melechinus*, *Xenocidaris*, *Cystocidaris*, *Palæodiscus*.

Genus *Rhabdocidaris*, *Leiocidaris*, *Dorocidaris*, *Stephanocidaris*, *Phyllacanthus*, *Porocidaris* (now divisions of *Cidaris*).

Genus *Discocidaris*, *Anaulocidaris*, *Schleinitzia*, *Eocidaris*.

Genus *Hyposalenia*, *Pseudosalenia*, *Poropeltis*, *Tiaris*, *Hemipygus*, *Pseudodiadema*, *Tetragramma*, *Hebertia*, *Echinodiadema*, Verr., *Triche-diadema*, *Plesiadiadema*, *Loriolia*, *Colpotiara*, *Garelia*, *Saxiguia*, *Gomphechinus*, *Micropeltis*, *Agarites*, *Pygomma*, *Echinocidaris*, Desm., *Coptechinus*, *Opechinus*, *Helicoidaris*, *Chrysomelon*, *Hippomê*, *Heliechinus*.

Genus *Mortonia*, Gray, *Rumphia*, *Peronella*, *Polyaster*, *Michelinis*, *Amphione*, *Lobophora*, *Galerites*, *Trematopygus*, *Paropygus*, *Oolopygus*, *Anthobrissus*, *Clypeolampas*, *Trochalia*, *Asterobrissus*, *Petalaster*, *Cyrtoma*, *Pseudopygaulus*, *Ananchytes*, *Oolaster*, *Stegaster*, *Cibaster*, *Pygopistes*, *Toxaster*, *Heteraster*, *Miotoxaster*, *Globator*.

Genus *Trachyaster*, *Ditremaster*, *Rachiosoma*, *Pliolampas*, *Thegaster*, *Pseudholaster*, *Hypopygurus*, *Atrapus*, *Abatus*, *Desoria*, *Leucaster*, *Tuberaster*, *Plesiaster*, *Opissaster*, *Periaster*, *Perionaster*, *Paraster*, *Anisaster*, *Brissomorpha*, *Heterobrissus*, *Isopneustes*, *Leiopneustes*, *Plagionotus*, *Xanthobrissus*, *Toxobrissus*, *Kleinia*, *Stomaporus*, *Deukia*, *Verbeckia*, *Concophorus*, *Peripneustes*, *Trachypatagus*, *Sarsella*, *Leskia*.

The following genera are considered of subgeneric value only:—

Genus (now subgenus) *Goniocidaris*, *Goniophorus*, *Heterosalenia*, *Hemidiadema*, *Hypodiadema*, *Pseudocidaris*, *Asterocidaris*, *Acropeltis*, *Microdiadema*, *Diademopsis*, *Hemipedina*, *Echinodiadema*, *Pseudopedina*, *Leiosoma*, *Pleurachinus*, *Salmacopsis*, *Psammechinus*, *Evechinus*, *Scutellina*, *Monostychia*, *Echinarachnius*, *Monophora*, *Astriclypeus*, *Nucleopygus*, *Rhynchopygus*, *Hardouinia*, *Pygorhynchus*, *Clypeopygus*, *Oriolampas*, *Jeromia*, *Lampadaster*, *Entomaster*, *Opisopneustes*, *Infulaster*, *Macraster*, *Tripylus*, *Moiropis*, *Meoma*, *Cycluster*, *Loncophorus*, *Plesiaster*, and *Macropneustes*.

A new family, *Plesiospatangidae*, is formed to include *Eolampas*, *Archiacia*, *Claviaster*, *Asterostoma*, *Pseudasterostoma*, n. g., and *Metaporkinus*.

The paper concludes with a brief explanation of the terms employed in describing the anatomy of the Echinoids.

29. [DUNCAN, P. M.] On some points in the Anatomy of the species of *Palæechinus* (Scouler), M'Coy, and a proposed Classification. Ann. N. H. iii, 1889, pp. 196-206, 1 woodcut.

The author describes (i) the Apical system and its variations; (ii) the anatomy of the ambulacral plates. The classification suggested is—Genus *Palæechinus*, M'Coy, *pars*, *P. gigas*, *P. sphaericus*, *P. ellipticus*, *P. intermedius*, *P. phillipsii*. Genus *Rhœechinus*, Keeping; *R. irregularis*, Keeping; *R. elegans*, M'Coy, sp.; *R. quadriserialis*, J. Wright, sp.; *R. sp.* (*Palæechinus* in Woodwardian Museum).

30. ECKSTEIN, K. Repetitorium der Zoologie. Leipzig: 8vo.

Echinodermata, pp. 40-44.

31. EDWARDS, C. L. Notes on the Embryology of *Mülleria agassizi*, Tel., a Holothurian common at Green Turtle Cay, Bahamas. Johns Hopk. Univ. Circ. viii, 1889, p. 37; also J. R. Micr. Soc. 1888, 6, p. 760.

Three polar globules are extruded.

32. FEWKES, J. W. On a new parasite of *Amphiura*. Ann. N. H. iii, 1889, pp. 154-156.

Account of a Crustacean (Copepodan) parasitic in the brood cavities of *Amphiura squamata*.

33. —. Development of Calcareous Plates of *Asterias*. J. R. Micr. Soc. 1889, i, pp. 61 & 62.

Abstract of paper in Bull. Mus. C. Z. xvii, 1, pp. 1-52.

34. FOUQUÉ, F. Mission d'Andalousie. Mém.-prés. Ac. Sci. xxx, No. 2, *Oursins*, pp. 273 & 280, with woodcut.

A new species of *Rhabdocidaris* of Pliocene age, is described, but not named.

35. FREDERICQ, L. La Lutte pour l'Existence chez les Animaux Marins. Paris. L'autonomie chez. . . les Echinodermes . . . etc., pp. 264-270, figs. 35 & 36.

36. FRIÜ, A. Studien im Gebiete der Böhmischen Kreideformation. Palæontologische Untersuchungen der einzelnen Schichten. iv. Die Teplitzer Schichten. *Echinodermata*. Arch. naturw. Landesforsch. Böhmen. vii, 2, pp. 58 & 97-101, figs. 123-132.

P. 58 contains table of geological distribution; pp. 97-101, short descriptions and figures.

37. GAUTHIER, V. Note sur les Échinides Crétacés recueillis par M. de Grossouvre. Bull. Soc. géol. (3) xvii, 6, pp. 525-532, pl. xiii.

3 new species are figured and described: *Hemiasster grossouvrei*, *Periasster clionensis*, and *Cassidulus peroni*; in addition, a short list is given of the more important forms in the collection.

38. GEINITZ, F. E. Die Kreidegeschiebe des Mecklenbùrgischen Diluviums. Echinodermen. Z. geol. Ges. xl. pp. 740 & 741.

39. GRABER, V. Ueber die Empfindlichkeit einiger Meertiere gegen Riechstoffe. Biol. Centralbl. viii, pp. 747-750.

The author describes experiments upon the olfactory power of *Antolus rosacea*, *Echinaster sepositus*, *Ophioderma longicauda*, *Echinus microtuberculatus*, *Holothuria tubulosa*, *Synapta digitata*.

40. GREGORY, J. W. On a New Species of the Genus *Pentaster* (*P. brisingoides*) from the Upper Silurian of Australia. Geol. Mag. (3) vi, i, pp. 24-27, with woodcut.

41. GREPPIN, E. Description de la Grande Oolithe des Environs de Bâle. Échinides. Mém. Soc. Pal. Suisse, xv, pp. 132-134.

Pentacrinus nicoleti is the only species mentioned [*vide* BATHER (3)].

42. GRIEG, J. A. Undersøgelser over Dyrelivet i de Vestlandske Fjorde II. Echinodermes, Annelides, &c. Bergens Mus. Aarsber. 1888 (publ. 1889), No. 2, pp. 1-7, 2 pls.

List of Crinoids, Ophiuroids, Asteroids, Echinoids, and Holothuroids. A new *Cucumaria* is described and figured.

43. HADDON, A. C., & GREEN, W. S. Second Report of the Marine Fauna of the South-West of Ireland. P. R. Irish Soc. (3) i, i, pp. 29-56.

Contains (p. 35 *et seq.*) account of Echinoderms captured, the most noticeable being *Holothuria tremula*.

44. HAMANN, O. Anatomie der Ophiuren und Crinoiden. Jen. Z. Nat. xxiii, pp. 233-384, taf. xii-xxiii; also J. R. Micr. Soc. 1889, 4, pp. 525 & 526.

A detailed account of the two groups under the following headings:—

Ophiurids.—(1) Nervous system, pp. 235-260; (2) Enterocœl, pp. 260-262; (3) Water vascular system, pp. 262-267; (4) Schizocœl, pp. 267-269; (5) Lacunar blood system, pp. 269-274; (6) Genital cavities and maturation of germinal cells from the genital pouches, pp. 274-279; (7) Alimentary canal, pp. 279-283; (8) Musculature and connective tissue, pp. 283-286.

Crinoids.—(1) Nervous system, pp. 287-314; (2) Water vascular system, pp. 314-322; (3) Enterocœl and its brachial offshoots, pp. 322-333; (4) Schizocœl spaces and Lacunar blood system, pp. 333-339; (5) Glandular (dorsal) organ, pp. 339-342; (6) Genital cavities and maturation in the pinnules, pp. 343-348; (7) Musculature and connective tissue, pp. 348-355; (8) Alimentary canal, pp. 355-358.

The author concludes with a summary of results, pp. 359-368; a discussion of the phylogeny, pp. 368-373; and an appendix dealing with the work of other investigators, pp. 373-376.

Semon's speculations as to the phylogeny are criticised and opposed.

45. HAMAN, O. Morphology of Crinoids. J. R. Micr. Soc. 1889, 4, p. 528. Abstract of Nachr. Ges. Götting. 1888, pp. 127-131.

46. HEILPRIN, A. The Bermuda Islands. Philadelphia: 8vo. *Holothuroidea*, pp. 136-142; *Asteroidea*, pp. 142 & 143; *Ophiuroidea*, pp. 143 & 144; *Echinoidea*, pp. 144 & 145; pla. xii & xiii.
Holothuria, 1 n. sp., *Semperia*, 1 n. sp., *Stichopus*, 2 n. spp., are described.
47. HERDMAN, W. A. Brief Notes on the Marine Invertebrate Fauna of the Southern End of the Isle of Man. Vannin Lioar, i, 3.
 The Echinoderms obtained are briefly mentioned with reference to special distribution.
48. HÉROUARD, E. Recherches sur les Holothurides des Côtes de France. Arch. Z. expér. (2) vii, 4, pp. 535-704, pls. xxv-xxxii, 6 woodcuts.
 A full account of the habits, anatomy, &c., of the forms described. 1 *Colochirus* and 2 *Thyone* are described as new.
49. HOYLE, W. E. On the Deep-water Fauna of the Clyde Sea-Area. *Echinodermata*. J. L. S. xx, No. 123, pp. 458 & 459.
50. HYATT, —. To prepare sections of Spines of *Echinus* for Micro-Slides. J. Micr. & Nat. Sci. n.s. ii, 7, p. 156.
51. IVES, J. E. Variation in *Ophiura panamensis* and *Ophiura teres*. P. Ac. Philad. 1889, i, pp. 76 & 77.
 The colour varies greatly; the darkest forms are found northwards.
52. —. On a new genus and two new species of Ophiurans. *Op. cit.* ii, pp. 143-145, 8 woodcuts.
 A new genus, *Ophiuncus*, is described, with 2 new species.
53. —. Catalogue of the *Asteroidea* and *Ophiuroidea* in the Collection of the Academy of Natural Sciences of Philadelphia. T. c. pp. 169-179.
54. JICKELI, C. F. Vorläufige Mittheilungen über das Nervensystem der Echinodermen. (3) Ueber das Nervensystem der Ophiuren. Zool. Anz. 1889, No. 305, pp. 213-218; also J. R. Micr. Soc. 1889, 4, p. 527.
55. JOHN, G. Ueber bohrende Seeigel. Arch. f. Nat. Bd. i, Hf. 3, 1889, pp. 268-302, pl. xv; also J. R. Micr. Soc. 1889, 6, p. 760.
 Treats of the various boring species, the means employed, and the object to be attained. The holes are made by the masticatory apparatus and spines.
56. KEYES, C. B. Variation exhibited by a Carbonic Gasteropod. Am. Geol. iii, No. 5, pp. 330-333, figs. 1 & 2.
 Deals with relations of *Platyceras* to Crinoids.
57. —. The Carboniferous *Echinodermata* of the Mississippi Basin. Am. J. Sci. (3) xxxviii. No. 225, pp. 186-193.
 Contains a synoptical table of the Carboniferous *Echinodermata*, p. 189.
58. —. On the attachment of *Platyceras* to Palæocrinoids, and its effects in Modifying the form of the Shell. P. Am. Phil. Soc. xxv, pp. 231-243, 1 pl.; also Am. Geol. iii, 1889, p. 148.
 The Gasteropod was probably nourished on the excreta of the Crinoid. 4 new species of *Platyceras* are described.

59. KORSCHOLT, E. Zur Bildung des mittleren Keimblatts bei den Echinodermen. Zool. Jahrb. iii, 1889, pp. 653-676, pl. xxxi, 6 woodcuts; also J. R. Micr. Soc. 1889, 5, p. 645.

The author describes the phenomena in *Strongylocentrotus lividus*, and discusses the origin of the mesoderm in all Echinoderms. The mesenchyme does not arise till after gastrulation in *Holothuria*, *Synapta*, Asterids and Crinoids.

60. KOWALEVSKY, A. Beitrag zur Kenntniss der Exkretionsorgane Echinodermen. Biol. Centralbl. ix, 3, pp. 73 & 74.

The author gives an account of experiments on the excretory systems of *Astropecten aurantiacus*, *A. pentacanthus*, *Echinus microtuberculatus*, and *Strongylocentrotus lividus*.

61. LAMBERT, J. Note sur le Développement de l'*Echinospatangus neocomiensis* (d'Orbigny). Bull. Soc. Youne, xliii, i (2), pp. 45-53, 5 woodcuts.

The author describes points in the development from series obtained from the Neocomian of Auxerre. Diagnoses of the species included in the genus are given, pp. 56-58.

62. LAMPERT, K. Die während der Expedition S.M.S. 'Gazelle,' 1874-1876, von Prof. Dr. Th. Studer gesammelten Holothurien. Zool. Jahrb. iv, 4, pp. 806-858, pl. xxiv.

7 new species are described and 1 new variety. The new species include 1 new *Holothuria*, 5 *Dendrochirota*, 1 *Anapta*; the variety is of *Synapta benedeni*, Ludw. In all, 41 species were taken of 13 genera.

63. LORIOU, P. DE. Matériaux pour l'Étude Stratigraphique et Paléontologique de la Province d'Angola. Description des Échinides. Mém. Soc. Phys. Genève. xxx, i, No. 2, pp. 97-114, pls. vi-viii (pub. 1888).

9 new species, belonging to the genera *Cidaris*, *Salenia*, *Pygurus*, *Asterobrius* (*Trochalia*, Pomel), *Stigmatopygus*, *Isaster*, *Holaster*, and *Epiaster* are described and figured. *Trochalia*, Pomel, is changed to *Asterobrius*. The species are from Cretaceous strata.

64. —. Note sur deux Echinodermes nouveaux. Bull. Soc. géol. (3) xvii, 3, pp. 150-155, pl. vi.

A new species of *Athenea* from the Senonian of Algeria, and a Crinoid from Turkestan, for which a new genus—*Austinocrinus*—is founded, are described. Both are much mutilated specimens.

65. —. Observations relative à *Austinocrinus komaroffi* (*Pentacrinus erckerti*, Dames). Op. cit. 7, p. 556.

This form to be known as *Austinocrinus erckerti*, Dames sp. Vide DAMES, in Z. geol. Ges. xxxvii, 1885, p. 219.

66. LUDWIG, H. Echinodermata. Pt. III. Bronn's Klassen u. Ordnungen ii, 3, pp. 49-80, pls. i-v. (Leipzig & Heidelberg: 1889.) Also J. R. Micr. Soc. 1889, 4, pp. 514-525. Pt. IV. Bronn's Klassen u. Ordnungen, ii, 3, pp. 81-128. Also J. R. Micr. Soc. 1889, pp. 644 & 645.

67. [LUDWIG, H.] Nochmals die *Rhopalodina lageniformis*. Z. wiss. Zool. xlviii, pp. 60-66; also J. R. Micr. Soc. 1889, 3, p. 392.

The systematic position of this form is discussed, and its anatomy described. Previous descriptions are somewhat inaccurate.

68. —. *Ophiopteron elegans*. J. R. Micr. Soc. 1889, i, p. 66. Abstract of Z. wiss. Zool. xlvii, 3, pp. 459-464.

69. —. *Ophiopteron elegans*, a new, probably Natatory, Form of Ophiurid. Ann. N. H. iii, 1889, pp. 44-49. Translated from Z. wiss. Zool. xlvii, 3, pp. 459-464.

70. —. Berechtigung zu dem von Dr. R. Semon beschriebenen Falle von "Neubildung der Scheibe in der Mitte eines abgebrochenen Seesternarmes." Zool. Anz. 1889, No. 315, pp. 454-457; also J. R. Micr. Soc. 1890, i, p. 43.

The author is of opinion that Semon has misinterpreted the appearances, and that this is no case of regeneration of the disk. *Vide* SEMON (80).

71. MACMUNN, C. A. Contributions to Animal Chromatology. Echinoderms. Q. J. Micr. Sci. xxx, pt. 2, pp. 51-70, pl. vi; also J. Mar. Biol. Ass. (n.s.) i, March, 1889, pp. 56 & 57.

The colouring matter of *Antedon rosacea* is not antedonin. Symbiotic algae are absent. The colouring matter of other Crinoids (collected by the 'Challenger') are described. The blood of *Holothuria nigra* contains a red lipochrome like that of certain Crustaceans. An account is also given of the various pigments present in *Asteroides*.

72. MILLER, S. A. North American Geology and Palæontology. Cincinnati, Ohio: 1889. *Echinodermata*, pp. 211-289, figs. 231-447.

Contains an alphabetical list of genera and species.

73. NEUMAYR, M. Die Stämme des Thierreichs. Wirbellose Thiere, i. Wien & Prag: 1889. Echinodermen, pp. 348-504, figs. 77-150; also pp. 577-582.

An account of the general anatomy, &c., is given, with special reference to phylogeny. Among the *Cystidea* a new genus, *Arachnocystis*, is founded (type, *Echinosphærites infauustus*, Barr.). A brief classification of Crinoids occurs, pp. 462 & 463. The general relations of the groups and their phylogeny are discussed, pp. 486-501. On pp. 501-504 the habitat of Echinoderms and the characters of deep-sea fauna are dealt with.

74. PERRIER, E. Mémoire sur l'Organisation et le Développement de la Comatule de la Méditerranée. (*Antedon rosacea*, Linck). N. Arch. Mus. (3) i, ii, pp. 169-286 (à suivre).

An elaborate memoir describing (1) external anatomy, (2) perisome, (3) calcareous pieces, (4) digestive tract, (5) visceral sac, (6) vibratile cords, (7) water-vascular system, (8) intestinal vessels, genital plexus, labial plexus, and spongy organ, (9) nervous system. Developmental part and description of genital system to follow.

75. POUCHET, G., & CHABRY, —. *Physiologie Animale*.—De la production des larves monstreuses de l'Oursin par privation de Chaux. C.R. cviii, 1889, pp. 196–198; also *J. R. Micr. Soc.* 1889, pp. 392 & 393.

Experiments on Echinid larvæ affected by deprivation of carbonate of lime.

76. RINGUEBERG, E. N. S. The *Calceocrinida*; a Revision of the Family, with Description of some New Species. *Ann. N. York Acad. Sci.* 1889, iv, art. xvii [19 pp.], pls. x & xi.

Calceocrinus, n. g., founded on *C. (Calceocrinus) furcillatus*, W. R. Bill, sp., includes *C. rugosus*, W. R. Bill, sp., *C. billingsianus*, n. sp., *C. arcticus*, E. Bill, sp. *Proclivoocrinus*, n. g., founded on *Calceocrinus radiculatus*, Ringueb., includes *P. chrysalis*, Hall, sp. *Calceocrinus* revised on type *C. typus*, n. sp. 43 other new species are described.

77. ROWLEY, R. R. Observations on three Kinderhook Fossils. *Am. Geol.* iii, No. 4, pp. 275 & 276. [Nothing new.]

78. SARASIN, P. & F. Ueber die Anatomie der Echinothuriden und die Phylogenie der Echinodermen. *JB. Mineral.* 1889, II, i, pp. 54–59.

79. SEMON, R. Development of *Synapta digitata*. *J. R. Micr. Soc.* 1889, i, pp. 62–66; abstract of *Jen. Z. Nat.* xxii, i, ii, pp. 175–309.

80. —. Ein Fall von Neubildung der Scheibe in der Mitte eines abgebrochenen Seesternarmes. *Op. cit.* xxiii, pp. 585–594, taf. xxix; also *J. R. Micr. Soc.* 1890, i, p. 46, *vide* LUDWIG (70).

81. —. Die Homologien innerhalb des Echinodermenstammes. *Morph. JB.* xv, 2, pp. 253–307; also *J. R. Micr. Soc.* 1889, 6, pp. 759 & 760.

An exhaustive discussion of Echinoderm homologies, dealing with (1) water-vascular system (pp. 257–266), (2) nervous system (pp. 266–268), (3) muscular system (pp. 268–273), (4) skeletal system (pp. 273–275), (5) intermediate fossil forms (pp. 275–287), (6) oral skeleton of Echinoids and Holothurians (pp. 287–295), (7) plates of apical pole (pp. 295–305). The author concludes that, as far as essential characters are concerned, the gut, enterocœl, water-vascular, and nervous systems are homologous structures throughout the group. Other structures, especially those of the skeleton, are analogous only, their similarities being due to “homoplasy;” others partly homologous and partly analogous, *e. g.*, the muscular system and portions of the water-vascular and nervous system of Holothurians, and the primary and secondary tentacles of various orders. The homologies of the blood-vascular system cannot yet be determined. The dorsal organ is homologous throughout. Finally, the *Echinodermata* are undoubtedly derived from one and the same ancestral stock.

82. SIMROTH, H. Zur Kenntniss der Azorenfauna. *Echinodermata*. *Arch. f. Nat.* Bd. i, Hf. 3, 1888 (pub. April, 1889), pp. 231–234.

The author mentions (p. 233) interesting cases of Echinoids mimicking Actinians.

83. SLADEN, W. P. Report on the *Asteroidea* of the Mergui Archipelago, collected for the Trustees of the Indian Museum, Calcutta, by Dr. John Anderson. J. L. S. xxi, pp. 319-330, pl. xxviii; also J. R. Micr. Soc. 1890, i, p. 46.

The collection contains, besides others, 2 new *Astropecten* and 1 new *Nepanthia*. Many of the known forms exhibit interesting variations.

84. —. Report on the *Asteroidea* collected during the Voyage of H.M.S. 'Challenger' during the years 1873-76. Challenger Reports, xxx, pt. li. Text and Plates. Text, pp. i-xlii & 1-893. Plates i-cxvii, and map showing collecting stations. (Notice in J. R. Micr. Soc, 1889, 5, pp. 645 & 646.)

This Report amounts to a complete monograph of the group. A list of all known species of recent *Asteroidea*, with their distribution, synonyms, &c., is given. In the 'Challenger' collection there are 34 genera, 4 subgenera, 184 species, and 12 varieties which are new. Besides these there are described as new, from other collections, 17 genera, 1 subgenus, 17 species, and 4 varieties. A new classification is given, which is as follows:—

Class. ASTEROIDEA.

Subclass. EUASTEROIDEA, Sladen.

Order 1. PHANEROZONIA, Sladen.

Fam. I. ARCHASTERIDÆ (Vignier, 1878), emend. Sladen, 1886.

Subfam. PARARCHASTERINÆ, Sladen.

Genus. *Pararchaster*, Sladen, with 5 species and 1 variety, all new.

Genus. *Pontaster*, Sladen, with 12 species, of which 11 are new, and 3 varieties all new.

Subfam. PLUTONASTERINÆ, Sladen.

Genus. *Dytaster*, Sladen, with 7 species and 2 varieties, all new.

Genus. *Plutonaster*, Sladen, with 6 species, of which 5 are new and 1 new variety.

Subgenus. *Tethyaster*, n. subg., with 2 species.

Genus. *Lonchotaster*, Sladen, with 2 species, both new.

Subfam. PSEUDARCHASTERINÆ, Sladen.

Genus. *Pseudarchaster*, Sladen, with 3 species, all new.

Genus. *Aphroditaster*, Sladen, with 1 species, new.

Subfam. ARCHASTERINÆ, Sladen.

Genus. *Archaster*, Müller & Troschell, emend. Sladen, with 2 species.

Fam. II. PORCELLANASTERIDÆ, Sladen (1883), emend. 1886.

Subfam. PORCELLANASTERINÆ, Sladen.

Genus. *Porcellanaster*, Wyv. - Thom., with 6 species, 1 new (?).

Genus. *Styracaster*, Sladen, with 2 species.

Genus. *Hyphalaster*, Sladen, with 4 species.

Genus. *Thoracaster*, Sladen, with 1 species

Genus. *Moiraster*, n. g., with 1 species.

Genus. *Astropecten*, Linck, with 16 species and

Genus. *Psilaster*, Sladen, with 5 species, 4 new

Genus. *Phozaster*, Sladen, with 1 species, new

Genus. *Bathybiaster*, Danlson & Kor, with 3 species
and 1 variety, new.

Subfam. LUIDIINÆ, Sladen.

Genus. *Luidia*, Forbes, with 9 species, 5 new.

Fam. IV. *PENTAGONASTERIDÆ*, Perrier.

Subfam. *PENTAGONASTERINÆ*, Sladen, 1888.

Genus. *Pentagonaster*, Linck, with 7 species, 4

Genus. *Calliaster*, Gray, with 2 species, 1 new.

Genus. *Chitonaster*, Sladen, with 1 species, new

Genus. *Gnathaster*, n. g., with 3 species, 2 new

Genus. *Nymphaster*, Sladen, with 5 species, a
variety, new.

Genus. *Paragonaster*, Sladen, with 2 species, b

Genus. *Nectria*, Gray, with 1 species.

Subfam. *GONIODISCINÆ*, Sladen.

Genus. *Stellaster*, Gray, with 6 species, 1 new.

Genus. *Leptogonaster*, Sladen, with 1 species, n

Subfam. *MIMASTERINÆ*, Sladen.

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Fam. V. *ANTHENIDÆ*, Perrier.

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Fam. VI. *PENTACEROTIDÆ* (Gray), Perrier, emend

Genus. *Pentaceros*, Linck, with 4 species, 1
variety, new.

Genus. *Pentaceropsis*, n. g., with 1 species.

- Genus. *Cycethra*, Bell, with 4 species, 3 new.
 Genus. *Ganeria*, Gray, with 1 species.
- Subfam. ASTERININÆ, Sladen.
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 Genus. *Nepanthia*, Gray, with 3 species.
 Genus. *Asterina*, Nardo, with 7 species.
- Subfam. PALMIPEDINÆ, Sladen.
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- Order 2. CRYPTOZONIA, Sladen.
- Fam. I. LINCKIID.É, Perrier, emend.
- Subfam. CHÆTASTERINÆ, Sladen.
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- Subfam. LINCKIINÆ, Sladen.
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 Genus. *Ophidiaster*, Agassiz, with 21 species, 2 new.
 Genus. *Leiaster*, Peters, with 5 species.
 Genus. *Linckia*, Nardo, with 12 species.
 Genus. *Nardou*, Gray, emend., with 10 species.
 Genus. *Narcissia*, Gray, with 2 species, 1 new.
- Subfam. METRODIRINÆ, Sladen.
 Genus. *Metrodira*, Gray, with 2 species.
- Fam. II. ZOROASTERID.É, Sladen.
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 Genus. *Cnemidaster*, n. g., with 1 species, new.
 Genus. *Pholidaster*, Sladen, with 2 species, both new.
- Fam. III. STICHASTERID.É, Perrier.
 Genus. *Stichaster*, Müll. & Trosch., with 10 species, 2 new.
 Genus. *Neomorphaster*, n. g., with 1 species, new.
 Genus. *Tursaster*, n. g., with 1 species, new.
- Fam. IV. SOLASTERID.É, Perrier.
- Subfam. SOLASTERINÆ, Sladen.
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 Genus. *Rhipidaster*, n. g., with 1 species, new.
 Genus. *Solaster*, Forbes, with 9 species, 4 new.
 Genus. *Lophaster*, Verrill, with 2 species, 1 new.
- Subfam. KORETHRASTERINÆ, Sladen.
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- Subfam. PTERASTERINÆ, Sladen.
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 Genus. *Benthaster*, Sladen, with 2 species.
- Subfam. PYTHONASTERINÆ, Sladen.
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The Report concludes with tables of the geographical and bathymetrical distribution of every species, together with the nature of the sea bottom and temperature of the water where possible.

85. SPIERS, W. Some Remarkable Fossils. iv. Sea Lilies. *Wealey Nat. iii*, No. 30, pp. 178-182, 3 woodcuts.
 86. SWAINSON, G. Dredging off Puffin Island for the Rosy Feather Star. *Op. cit.* No. 29, pp. 138-142, 2 woodcuts.
 87. TOPSENT, E. Différenciation remarquable d'un Tube Génital Male de *Cucumaria pentacles*, L. *Bull. Soc. L. Norm.* (4) ii, Ann. 1887-88 (pub. 1889) pp. 112-114.
 88. WACHSMUTH, C., & SPRINGER, F. Ventral structure of *Taxocrinus* and *Haplocrinus*. *J. R. Micr. Soc.* 1889, 2, p. 228. Abstract of *P. Ac. Philad.* 1888, 3, pp. 364-390.
 89. WHITE, C. A. Contribuições á Paleontologia do Brasil. *Echinodermata*. *Arch. Mus. R.* Jan. vii, 1887, pp. 245-263, pl. xxviii.
- Cretaceous forms, all Echinoids except 1 Asteroid, *Cidarida* being most

numerous; 7 new *Cidaridæ* are described, one falling into a new genus, *Heteropodia*; 2 *Galeritidæ*, 2 *Cassidulidæ*, 1 *Spatangidæ*, are described as new.

- 9). WHITEAVES, J. F. On some Fossils from the Hamilton formation of Ontario, with a list of species at present known from that formation and province. Contributions to Canadian Palæontology. (Geological and Nat. Hist. Survey of Canada.) Vol. I. *Echinodermata*, pp. 94-110 & 121, pls. xii-xiv.

The strata belong to the Middle Devonian System, Crinoids and Blastoids occur in some numbers; of the former, 2 new species and fragments of 2 undetermined species; of the latter 1 doubtful new species are described.

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- Cycethra*, Bell. *C. electilis*, n. sp., p. 377; *C. nitida*, n. sp., p. 379; *C. paiguia*, n. sp., p. 380;
- Patiria*, Gray. *P. bellula*, n. sp., p. 385; SLADEN (84).
- Nepanthia*, Gray. *N. suffurcinata*, n. sp., p. 328; *id.* (83).
- Palmipes*, Linck. *P. diaphanus*, n. sp., p. 395;
- Ophidiaster*, Agassiz. *O. tuberifer*, n. sp., p. 404; *O. helicostichus*, n. sp., p. 405;
- Narcissia*, Gray. *N. trigonaria*, n. sp., p. 414;
- Zoroaster*, Wyv.-Thom. *Z. tenuis*, n. sp., p. 421;
- Cnemidaster*, n. g., p. 423. *C. wyvillii*, n. sp., p. 424;
- Pholidaster*, Sladen. *P. squamatus*, n. sp., p. 427; *P. distinctus*, n. sp., p. 429;
- Stichaster*, Müll. & Trosch. *S. felipes*, n. sp., p. 433; *S. polygrammus*, n. sp., p. 434; SLADEN (84).
- Neomorphaster*, n. g. *N. eustichus*, n. sp., p. 438;
- Tarsaster*, n. g. *T. stoichodes*, n. sp., p. 440;
- Crossaster*, Müll. & Trosch. *C. papposus* var. *septentrionalis*, n. var., p. 444; *C. penicillatus*, n. sp., p. 446;
- Rhipidaster*, n. g., p. 447. *R. rannipes*, n. sp., p. 448;
- Solaster*, Forbes. *S. parillatus*, n. sp., p. 452; *S. regularis*, n. sp., p. 454; *S. subarcuatus*, n. sp., p. 455; *S. torulatus*, n. sp., p. 457;
- Lophaster*, Verril. *L. stellans*, n. sp., p. 460;
- Peribolaster*, Sladen. *P. folliculatus*, n. sp., p. 465;
- Pteraster*, Müll. & Trosch. *P. militaris* var. *prolata*, n. var., p. 472;
- Pythonaster*, Sladen. *P. murrayi*, n. sp., p. 532;
- Cribrella* (Agassiz), Forbes. *C. compacta*, n. sp., p. 543; *C. obesa*, n. sp., p. 544; *C. praestans*, n. sp., p. 545; *C. simplex*, n. sp., p. 547, var. *granulosa*, n. var., p. 548; *C. suffluta*, n. sp., p. 549;
- Perknaster*, n. g., p. 550. *P. fuscus*, n. sp., p. 551; *P. densus*, n. sp., p. 552;
- Pedicellaster*, Sars. *P. hypernotius*, n. sp., p. 558;
- Asterias*, Linné. *A. vesiculosa*, n. sp., p. 568; *A. torquata*, n. sp., p. 570; *A. glomerata*, n. sp., p. 571; *A. versicolor*, n. sp., p. 573;
- Cosmasterias*, n. subg., p. 576. *A. (C.) tomidata*, n. sp., p. 576;
- Smilasterias*, n. subg., p. 578. *A. (S.) scalprifera*, n. sp., p. 578; *A. (S.) triremis*, n. sp., p. 579;
- Hydrasterias*, n. subg., p. 581. *A. (H.) ophidion*, n. sp., p. 581;
- Stolasterias*, n. subg., p. 583. *A. (S.) volsellata*, n. sp., p. 584; *A. (S.) stichantha*, n. sp., p. 586; *A. (S.) eustyla*, n. sp., p. 587;
- Calcesterias*, Perrier. *C. stolidota*, n. sp., p. 590;
- Labidiaster*, Lütken. *L. annulatus*, n. sp., p. 595;
- Olinia*, Perrier. *O. pandina*, n. sp., p. 598; SLADEN (84).
- Brisinga*, Asbjørnsen. *B. verticillata*, n. sp., p. 604; *B. ericophora*,

n. sp., p. 606; *B. armillata*, n. sp., p. 608; *B. membranacea*, n. sp., p. 613; *B. discincta*, n. sp., p. 613;

Freyella, Perrier. *F. pennata*, n. sp., p. 618; *F. polycnem*, p. 621; *F. echinata*, n. sp., p. 623; *F. fragilissima*, n. sp., p. 629; *F. bracteata*, n. sp., p. 629; *F. dimorpha*, n. sp., p. 632; *F. rem.*, p. 635; *F. tuberculata*, n. sp., p. 638; *F. benthophila*, n. sp., p. 643; *F. attenuata*, n. sp., p. 645;

Colpaster, n. g., p. 647. *C. scutigerula*, n. sp., p. 648; SLADEN (*Oreaster thurstoni*, n. sp., p. 385; BELL (8).

VERMES.

BY

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I.—INTRODUCTION.

EVEN more work on *Vermes* appeared in 1889 than in 1888. There is not very much bearing directly on Phylogeny; but HARMER on *Dinophilus* and the *Archiannelida*; PLATE on the *Trochophores*; SHIPLEY on *Phymosoma* and its relations to *Phoronis*; ZELINKA on the *Gasterotricha* as *Trochhelminthes*; and ZSCHOKKE on *Tænia*, are especially noteworthy.

FRIEDLÄNDER & HALLER furnish very important accounts of the anatomy and histology of the nervous system: in Embryology the monographs of ROULE on *Enchytraeoides*, and WILSON on the Earthworm, are of special interest.

Rotifera. 16 new species have been described. A supplement to HUDSON & GOSSE's *Rotifera* is published; and PLATE states, *inter alia*, the presence of a rudimentary oviduct in *Rotifer vulgaris*.

Gasterotricha. 3 new species; *Gossea*, *Lepidoderma*, new genera. ZELINKA's treatise on them is among the most important monographs of the year.

Acanthocephala. 1 new species.

Nematoda. 26 new species, and the following 14 new genera: *Araeolaimus*, *Aronolaimus*, *Camacolaimus*, *Cylicolaimus*, *Desmodora*, *Dolycholaimus*, *Halalaimus*, *Halichoanolaimus*, *Hypodontolaimus*, *Penzancia* (subg.), *Monoposthia*, *Syringolaimus*, *Terschellingia*, *Thalassironus*. DE MAN contributes several important memoirs; and the monograph of BOS is concluded.

Archiannelida. 1 new species.

Oligochaeta. 32 new species and 5 new genera—*Fredericia*, *Henlea*, *Marionnia*, *Neodrilus*, *Rhododrilus*: a very large number of papers has been published on this group.

Polychaeta. 10 new species.

Gephyrea. 4 new species.

Turbellaria. 11 new species; 1 new genus, *Otoplana*.

Cestoda. 17 new species; 6 new genera—*Dinobothrium*, *Diplobothrium*, *Paratenia*, *Pelichnibothrium*, *Rhinebothrium*, *Thysanocephalus*. Very many important papers, among which may be noted CLAUS & PINTNER on the structure and homologies of the Tape-worm; and ZSCHOKKE's elaborate researches on the anatomy and histology of this group have appeared.

Trematoda. 10 new species, and 1 new subgenus, *Mesocotyle*.

In all 126 new species, and 29 new genera have been described.

II.—LIST OF PUBLICATIONS.

ADUCCO, V. (1) La sostanza colorante rouge de l'*Eustrongylus gigas*. Arch. Ital. Biol. xi, pp. 52-69.

Colouring matter is in the hæmolymp and in the cuticle: it resembles oxyhæmoglobin, but it resists acetic acid better, and is not so readily reduced.

— (2) Red colouring matter of *Eustrongylus gigas*. J. R. Micr. Soc. 1889, p. 225.

Abstract of paper cited in Zool. Rec. 1888.

AGAESSIZ, A. Three Cruises of the 'Blake.' Bull. Mus. C. Z. xiv, xv. Characteristic deep-sea types—Worms, vol. xv, chap. xvii, pp. 52-67 with many woodcuts.

Chiefly *Polychæta*: no new species described. Figures of *Hyalinæcia Diopatra*, *Maldane*, *Eunice conglomerans*, *Buskiella abyssorum*, &c.

ANDREWS, E. A. Reproductive Organ of *Phascolosoma gouldii*. Zool. Anz. 1889, pp. 140-142. Abstract in J. R. Micr. Soc. 1889, p. 518.

Reproductive organ is a thickened fold of the peritoneum, supported by a structureless basement membrane. It consists of two fimbriated bands continuous with each other, ventral to the nerve-cord.

ANON. (1) Death from *Ankylostomum duodenale* in Australia. Brit. Med. J. 1889, i, p. 192.

Case of fatal anæmia caused by this worm; at the autopsy over 30 live worms were found in the duodenum.

— (2) The Giant Earthworm of Gippsland. Nature, xxxix, pp. 394 & 395, with cut.

A popular account of the habits, &c., of *Megascolides*, taken from Spencer's monograph [Zool. Rec. 1888].

— (3) The Effect of Rain on Earthworms. Am. Nat. 1889, pp. 687-689.

Enormous mortality after rain in Washington.

ANON. (4) Supposed fossils from the Southern Highlands. *Nature*, xxxix, pp. 300 & 301.

Account of lecture by Duke of Argyll : habits of modern Lobworms referred to.

——. (5) Hydatid cyst in *Obliquus externus*. *Brit. Med. J.* 1899, i, p. 149.

——. (6) Digestion of a live Tapeworm. *T. c. p.* 374.

ΔΡΑΤΗΥ, S. (1) Ueber das Kriechen von *Hirudo* und *Aulastoma*. *Zool. Jahrb.* iv, pp. 267 & 268.

A correction.

——. (2) Notiz über die Ringelung von *Piscicola*. *Zool. Anz.* 1889, pp. 649–652.

The segments of the middle of the body consist each of 14 annuli.

——. (3) A Magyarországi Píoczak Faunája. *Math. term. köz.* xxiii, pp. 305–372.

On Hungarian leeches (in Magyar only).

——. (4) A píoczafelek külső alakjáról. *Math. term. Ért.* 1889, pp. 341–344.

On the morphological position of *Hirudinea* (in Magyar only).

BALLOCH, E. A. Ova of *Trichocephalus dispar* in liver of Rat. *Am. Micr. J.* x, pp. 193–196, with 1 plate.

BANCROFT, T. L. On Filariae of Birds. *P. R. Soc. Queensl.* vi, pp. 58–62.

BARROIS, J. Une nouvelle conception de l'organisme Cestode. *Rev. Biol.* ii, pp. 18–23.

Not the scolex is to be considered ancestral but the first proglottis, which is readily comparable with the *Trematoda*.

BATESON, W. Suggestion that certain casts known as Bilobites may be regarded as casts of *Balanoglossus*. *P. Cambr. Phil. Soc.* vi, p. 298.

BEARD, J. Some Annelidan affinities in the ontogeny of the Vertebrate Nervous System. *Nature*, xxxix, pp. 259–261, with cut.

BEDDARD, F. E. (1) Note upon the Green Cells in the Integument of *Æolosoma tenebrarum*. *P. Z. S.* 1889, pp. 51–56, pl. v.

Pigment may be respiratory in function ; it is not chlorophyl.

——. (2) Notes on certain species of *Æolosoma*. *Ann. N. H.* 1889, ii, pp. 262–265.

The pigmented vesicles of *Æ. quarternarium*. There is no nucleus in the cells containing the coloured oil globules. Further notes on *Æ. headleyi*.

——. (3) On certain Points in the Structure of *Clitellio* (Claparède). *P. Z. S.* 1888, pp. 485–495, with 1 plate and 2 woodcuts. Abstract in *J. R. Micr. Soc.* 1889, p. 387.

Relations of *Clitellio* to other marine *Tubificidae* are discussed. Anatomy and systematic position of *Clitellio*.

- [BEDDARD, F. E.] (4) Contributions to the Anatomy of Earthworms with descriptions of some new species. *Q. J. Micr. Sci.* xix, pp. 421-479, pls. xxix & xxx.

Acanthodrilus: general anatomy and 3 new species, pp. 421-441. Classification of species of *Acanthodrilus*, with a genealogical tree, pp. 441-446. *Deinodrilus* is the form from which the different groups of *Acanthodrilus* have been derived. Reproductive organs of *Eudrilus*, pp. 446-456. There are two pairs of ovaries, and two pairs of oviducts, which are continuous with the ovaries, and which open in common with the spermatheca by a common aperture, one on each side of the body. Points in the anatomy of *Perichæta*, with 1 new species, pp. 457-474. Summary and Literature, pp. 475-479.

- (5) Three new species of Earthworms. *J. R. Micr. Soc.* 1889, p. 57. Abstract of Beddard (5), quoted in *Zool. Rec.* 1888.

- (6) Observations on the Structural Characters of certain new or little known Earthworms. *P. R. Soc. Edinb.* xiv, pp. 156-176, pl. v.

Earthworms from Australia, New Zealand, and Pacific Islands. *Acanthodrilus neglectus*, n. sp., and *A. dissimilis*, description and figs. *Neodrilus monocystis*, n. g. & sp., description with figs. *Urochæta*: setæ, septa, excretory organs, with figs. *Perichæta newcombii*, n. sp., with fig.; *P. upoluensis*, n. sp., with fig.

- (7) Reproductive organs of *Eudrilus*. *J. R. Micr. Soc.* 1889, p. 58.

Abstract of paper quoted in *Zool. Rec.* 1888.

- (8) Notes on the Marine *Oligochæta* of Plymouth. *J. Mar. Biol. Ass. (n.s.)*, pp. 69-71.

- (9) Preliminary Notes on some *Oligochæta*. *Zool. Anz.* 1889, pp. 533-536. Abstract in *J. R. Micr. Soc.* 1889, p. 754.

In the sexual *Dero* there is a clitellum bearing the sexual apertures. In a *Perichæta* from Borneo, the spermathecae are asymmetrical. Some of Rosa's criticisms on points in *Moniligastra* are accepted, but genitalia in *M. barwelli* still considered atypical.

- (10) On the Oligochaetous Fauna of N. Zealand, with preliminary descriptions of new species. *P. Z. S.* 1889, pp. 377-382. Abstract in *J. R. Micr. Soc.* 1889, p. 754.

Rhododrilus, n. g., and 4 new species.

- (11) Structure of *Urochæta* and *Dichogaster*, and Nephridia of Earthworms. *J. R. Micr. Soc.* 1889, p. 218.

Abstract of paper quoted in *Zool. Rec.* 1888.

- (12) On the Anatomy and Histology of *Phreocyetes*. *P. R. Soc. Edinb.* xvi, pp. 117-119. Abstract in *J. R. Micr. Soc.* 1889, p. 755.

- (13) Zoological Notes. *P. Phys. Soc. Edinb.* x, pp. 101-105, pl. v. On the genitalia of *Pachydrius*.

[BEDDARD, F. E.] (14) The Tail Bristles of a West Indian Earthworm. *Nature*, xxxix, pp. 15 & 16.

BELL, F. J. Remark on *Bipalium kewense*. *P. Z. S.* 1889, p. 5.

Said to eat Earthworms.

BENEDEN, P. J. VAN. Deux Cestodes nouveaux de *Lamna cornubica*. *Bull. Ac. Belg.* 1889, pp. 68-75, 1 pl.

Dinobothrium septaria, n. g. & sp., *Diplobothrium simile*, n. g. & sp.

BIEHRINGER, J. Neuere Arbeiten ueber Anatomie u. Entwicklungsgeschichte der Trematoden. *Biol. Centralbl.* viii, pp. 648-655.

II. Arbeiten zur Entwicklungsgesch. des Leberegels. An account of Leuckart's & Thomas's investigations.

BÖHMIG, L. *Microstoma papillosum*. *Zool. Anz.* 1889, pp. 479-483, woodcut.

Two individuals in the same chain are sexual; the chains are hermaphrodite.

BOS, J. RITZEMA. L'Anguillule de la Tige (*Tylenchus devastatrix*, Kühn), et les maladies des Plantes dues à ce Nématode. *Arch. Mus. Teyl.* ser. ii, vol. iii, pp. 333-348, with several plates.

Continuation of paper cited in *Zool. Rec.* 1888. Deals with the diseases in various plants. Plates are all botanical.

BOURNE, A. G. On certain Earthworms from the Western Himalayas and Dehra Dun. *J. A. S. B.* lviii, part II, pp. 110-117, pl. iii.

With *Typhaeus masoni*, n. sp. Abstract in *J. R. Micr. Soc.* 1890, pp. 39 & 40.

BOVERI, TH. Fertilization and Segmentation in *Ascaris megalocephala*. *J. R. Micr. Soc.* 1889, pp. 220-223.

Summary of one of Boveri's "Cell Studies."

BOWLBY, A. Organs and Parasites from cases of *Bilharzia*. *Brit. Med. J.* 1889, i, p. 891.

♀ worms removed from portal vein; ova from bladder in one case; in another ova were removed from a tumour in rectum. In a discussion, Stephen Mackenzie and Norman Moore contradict Zancarol's statement that ova from worms in the genito-urinary system have terminal spines, while ova from the alimentary canal have lateral spines. They have seen both forms of ova mixed in tissues from both habitats.

BRAUN, M. (1) Die embryonale Entwicklung der Cestoden. Zusammenfassen der Bericht. *CB. Bakt. Parasit.* v, pp. 667-671, 697-701, 727-732 & 756-760.

General account, with list of literature.

— (2) *Gyrocotyle*, *Amphiptyches* und Verwandte. *Op. cit.* vi, pp. 436-441.

A critical account, with literature.

[BRAUN, M.] (3) Ueber parasitische Strudelwürmer. Nachtrag. *Op. cit.* v, pp. 41-44.

Appendix to review of parasitic *Turbellaria*.

— (4) Die Lage der Excretionspori bei den Ectoparasitischen Trematoden. *Zool. Anz.* 1889, pp. 620-622.

Apertures of the excretory organs always found to be dorsal.

— (5) Notiz über *Tristomum elongatum*.

Excretory organs; genitalia; brain.

— (6) Bericht über die wissenschaftlichen Leistungen in der Naturgeschichte der freilebenden Würmer während der Jahre 1884-1887. *Arch. f. Nat.* 1886, ii, heft. iii, pp. 105-218; published in 1887 but omitted from last year's *Zool. Rec.*

— (7) Bericht über die wissenschaftlichen Leistungen in der Naturgeschichte der freilebenden Würmer während der Jahre 1886-1887. *T. c.* 1887, ii, pp. 61-164.

List of papers and review of works published in 1886 and 1887 free-living *Vermes*.

— (8) Würmer: *Vermes*. Bronn's Klassung u. Ordnungen 4th Bd. 7 and 8 Lief. Leipzig: 1889.

BÜRGER, O. Nervous system of Nemertines. *J. R. Micr. Soc.* 1889, pp. 519 & 520.

Abstract of paper cited in *Zool. Rec.* 1888.

BURN, W. B. Some little known Rotifers. *Sci. Goss.* 1889, pp. 105, 179-181, 266 & 267, with woodcuts.

1 new species.

CAMBRIDGE, F. O. P. On a new British Worm, *Allurus tetraedus*. *Dorset Field Club*, x, pp. 139-141, with woodcuts.

CAMERANO, L. (1) Sull' integumento dei Gordii. *Boll. Mus. Zool. Anat. Comp.* Torino, iv, No. 54.

— (2) I primi momenti dell' evoluzione dei Gordii. *Nota preliminare*. *Op. cit.* No. 61.

On the impregnation and maturation of the ovum.

— (3) Nuove osservazioni ai Gordii italiani. *Op. cit.* No. 66.

— (4) Osservazioni intorno alla Struttura dell' integumento di alcuni Nematelminti. *Atti Acc. Tor.* xxiv, pp. 757-776, pl. xiii.

Investigations, anatomical and chemical, on the integument of *Ascaris Gordius*, *Mermis*, &c.

CASSAIGNEAU, M. Les Entéroépneustes. *J. Microgr.* 1889, pp. 111-113, 135-141, 171-178, 197-204, 230-237, & 267-274, with many woodcuts.

A full resumé of our knowledge of the *Enteropneusta*, with excellent woodcuts.

CERFONTAINE, P. Recherches sur le système cutané et sur le système musculaire du Lombric terrestre. Bull. Ac. Belg. 1889, pp. 606-627.

Report on above by Van Beneden, Van Bambeke, and Fredericq. Paper is to be published in the "Mémoires" of the Society.

CHALMERS, A. J., & HARVEY-GIBSON, R. J. On the so-called Hepatic cells of the Earthworm (*Lumbricus terrestris*). P. Liverp. Biol. Club, i, pp. 51-57, pl. vii.

Paper omitted from earlier Records. Supports the hepatic nature of the cells.

CHATIN, J. Sur le *Tylenchus putrefaciens*. Bull. Soc. Philom. 8th ser., vol. i, pp. 34-37.

On presence of this Nematode in the onion.

CHILTON, C. Note on the Parasite (*Temnocephala*) found on the Fresh-water Crayfish of N. Zealand. Tr. N. Z. Inst. xxi, pp. 252 & 253.

It is commensal, and can live free for some time.

CLAUS, C. Zur morphologischen u. phylogenetischen Beurtheilung des Bandwurmerkörpers. Arb. z. Inst. Wien, viii, 3, pp. 1-14.

A re-statement, in the light of recent results, of the view that not the proglottis, but an entire unsegmented worm is the ancestral Cestode form.

COBB, N. A. (1) Beiträge zur Anatomie und Ontogenie der Nematoden. Jen. Z. Nat. xxiii, pp. 41-76, 3 pls. Abstract in J. R. Micr. Soc. 1889, p. 224.

With 2 new species.

— (2) Neue parasitische Nematoden. [Vide KÜKENTHAL, *infra*.]

COSMOVICI, L. Sur la vésicule contractile des Rotifères. Bull. Soc. Z. Fr. xiii, pp. 167-169.

CUNNINGHAM, J. T. The Nephridia of *Lanice conchilega*. Abstract in P. R. Soc. Edinb. xiv, pp. 238 & 239.

DALLA TORRE, K. W. Die Fauna von Helgoland. II. Supplement to Zool. Jahrb. 1889, 99 pp.

Vermes, pp. 87-92.

DENDY, A. Zoological Notes on a Trip to Walhalla. Vict. Nat. vi, 8, pp. 128-136.

Specially an account of "Cryptozoic Fauna," *i.e.*, animals living habitually under logs and stones. Land Planarians and terrestrial Nemertines, pp. 130-134.

DEWITZ, J. Bericht über die Rotatorien-literatur von 1882 bis 1886. Arch. f. Nat. 1886, ii, heft. iii, pp. 263-296; published in 1888, but omitted from last year's Zool. Rec.

ECKSTEIN, K. Repetitorium der Zoologie. Leipzig: Engelmann, 1889, 303 pp.

Vermes, pp. 44-55, with woodcuts.

FLETCHER, J. J. Notes on Australian Earthworms. Part v. *P. Lin.* Soc. N.S.W. iii, pp. 1521-1558. Abstract in *J. R. Micr. Soc.* 1889, p. 515.

20 new species are described.

FREDERICQ, L. La Lutte pour l'existence chez les Animaux Marins. Paris: Baillière et Fils, 1889, 393 pp.

Contains some woodcuts of *Vermes*, and many references to their habits and modes of life.

FRIEDLAENDER, B. (1) Ueber die markhaltigen Nervenfasern u. Neurochorde der Crustaceen u. Anneliden. *MT. z. Stat. Neap.* ix, pp. 266-263, pl. viii. Abstract in *J. R. Micr. Soc.* 1890, p. 20.

— (2) Central Nervous System of *Lumbricus*. *J. R. Micr. Soc.* 1889, p. 56.

Abstract of paper quoted in *Zool. Rec.* 1888.

GAGE, S. H. Determination of the number of *Trichinae* in a given quantity of Meat. *P. Am. Micr. Soc.* 10th Ann. Meet. pp. 191 & 192.

GARMAN, H. (1) New Earthworm. *J. R. Micr. Soc.* 1889, p. 220.

Abstract of paper quoted in *Zool. Rec.* 1888.

— (2) A preliminary report on the Animals of the Waters of the Mississippi Bottoms near Quincy, Ill., in August, 1888. *Springfield*: 1889, 53 pp.

Vermes, pp. 51 & 52.

GIBIER, P. Sur la vitalité des Trichines. *C.R.* 1889, ii, pp. 533 & 534.

GIGLIO-TOS, E. Studio istologico sull' integumento dell' *Aulastomus gulo*, Moq. Tand., with woodcut. *Boll. Mus. Zool. Anat. Comp.* Torino, iv, No. 67.

GÖLDI, A. Biologische Miscellen aus Brasilien. VII. Der Kaffeenematode Brasilien (Meloidogyne exigua). *Zool. Jahrb.* iv, pp. 262-267. Abstract in *J. R. Micr. Soc.* 1889, p. 518.

GOELICH, G. Genital and Segmental Organs of *Lumbricus*. *J. R. Micr. Soc.* 1889, p. 57.

Abstract of paper quoted in *Zool. Rec.* 1888.

GRASSI, —, & ROVELLI, —. (1) Embryologische Forschungen an Cestoden. *CB. Bakt. Parasit.* v, pp. 370-377 & 401-410, with 4 figures. Abstract in *J. R. Micr. Soc.* 1889, p. 389.

Complete account of the researches in *Rend. Acc. Rom. (infra)*.

— (2) Sviluppo del cisticerco e del cisticercoide. *Rend. Acc. Rom.* 1889, i, pp. 165-174, with woodcuts.

The various larvæ of Cestodes are arranged under the following groups:—

(1) Cisticerci with primitive invagination, and devoid of embryonal involution (*Archigetes*).

(2) Cisticerci with late invagination.

(a) Invagination simple (*T. elliptica*).(b) Invagination complicated by embryonal involution (*T. murina*).

(3) Cisticerci with precocious invagination, succeeded by embryonal involution.

GRIEG, J. A. *Annelida*. Bergen. Mus. Aarsber. pp. 7-9.

List from forms from fiords of West coast.

GRIFFITHS, A. B. (1) Researches on Problematical Organs of the *Invertebrata*. P. R. Soc. Edinb. xiv, pp. 230-238.*Oligochæta*, pp. 233 & 234. Nephridia contain uric acid, no guanine, urea, or calcium phosphate.— (2) On the Nephridia of *Hirudo medicinalis*. *T. c.* pp. 346-348.GROBBEN, C. Pericardial Glands of Annelids. *J. R. Micr. Soc.* 1889, p. 215.Abstract of paper quoted in *Zool. Rec.* 1888.

GUERNE, J. DE. Priapulides. Mission Scientifique du Cap Horn, vi, pp. 1-20, 2 pls.

General account of the group and anatomy of two forms, 1 new species.

GUERNE, J. DE, & RICHARD, J. Sur la faune des eaux douces du Groenland. *C.B.* 1889, i, pp. 630-632.*Triarthra longicela*, *Asplanchna helvetica*, *Anuræa cochlearis*, *A. longispina*, *Onochilus robor*, among the *Rotifera* are abundant.HALLER, B. Beiträge zur Kenntniss der Textur des Central-Nervensystems höheren Würmer. *Arb. z. Inst. Wien*, viii, 2, pp. 1-138, with 5 pls. Abstract in *J. R. Micr. Soc.* 1890, pp. 177-179.Elaborate investigation of the central nervous system in *Polychæta* (pp. 3-56). *Oligochæta* (pp. 56-90). Sipunculids (pp. 90-102). Nemertines (pp. 102-106). General results (pp. 106-138). *Inter alia*, author concludes that the Nemertines exhibit an exceedingly primitive condition from which on the one hand, the *Mollusca*, on the other the Annelids, *Hirudinea*, *Arthropoda*, and *Vertebrata* have sprung.HAMANN, O. (1) Vorläufige Mitteilungen zur Morphologie und Ontogenie der Echinorhynchen. *Nachr. Ges. Götting*, 1889, pp. 85-89.

A preliminary note.

— (2) In *Gammarus pulex* lebende Cysticercoiden mit Schwanzanhängen. *J. Z. Nat.* xxiv, pp. 1-7, with woodcuts and pl. i.Cisticerci of *Tania sinuosa* and *T. tenuirostris*.HARMER, S. F. (1) Notes on the Anatomy of *Dinophilus*. *J. Mar. Biol. Ass.* i (n.s.), pp. 119-143, 2 pls.A full account of *Dinophilus taniatus*, n. sp., with a discussion of the relations of *Dinophilus*.— (2) On a new species of *Dinophilus*. *P. Cambr. Phil. Soc.* vi, p. 359. *D. taniatus*, from Plymouth.

HECKERT, E. A. Development of *Distomum macrostomum*. Abstract J. R. Micr. Soc. 1889, pp. 42 & 43.

HORST, R. (1) On *Filaria* specimens from the right ventricle of the heart of *Felis onca*. Notes Leyd. Mus. xi, p. 16.

Probably *Filaria immitis*, from the heart of a Jaguar killed Surinam.

— (2) Contributions towards the knowledge of the *Annelida polychæta*. T. c. pp. 37-45, pl. iii.

II. On the branchiæ and bristles in genus *Arenicola*.

— (3) Contributions towards the knowledge of the *Annelida polychæta*. T. c. pp. 161-186, pls. vii & viii.

III. On species of *Nereis* belonging to the subgenus *Perinereis*. With 2 new species, and a list of the species of *Perinereis*.

HOYLE, W. E. On the Deep-water Fauna of the Clyde Sea-Area. J. L. S. xx, pp. 442-472, with a map.

Faunal lists.

HUDSON, C. T. (1) President's Address to the Royal Microscopical Society. J. R. Micr. Soc. 1889, pp. 169-179.

On *Rotifera* not yet found in the British Isles. *Rotifera* have been better worked in Britain than elsewhere, and of 240 known British species, 173 are confined to Britain. A list of about 50 *Rotifera* was selected from all *Rotifera* as known to be most widely distributed. The majority of these are shown to have a very wide distribution both in latitude, longitude, and altitude. Some of them reach even America, Australia, and New Zealand. Many instances of wide ranges are given. Eggs are carried by the wind, by waterfowl, and by other animals. Instances are given. Some can survive immersion in salt water, and a number (list given) are found both in fresh and salt water. *Rotifera* are adaptable, and their parts are extremely variable. Notwithstanding all the differences of structure it is clear that *Rotifera* are all related by descent; their curious habitats, wide dispersion, and great variations in structure are due to causes that have been at work for a very long period of time.

— (2) *Rotifera* and their distribution. Nature, xxxix, pp. 437-441.

Lecture to R. Micr. Soc.

HUDSON & GOSSE. The *Rotifera*. Supplement. Longmans, Green, & Co. : 1889, 64 pp., 4 pls.

With 4 new species.

IJIMA, I. The Source of *Bothriocephalus latus* in Japan. J. Coll. Sci. Japan, ii, pp. 49-56, with a woodcut.

Reaches man chiefly from *Onchorhynchus huberi*. Author proved it by eating larvæ from that fish. *B. latus* is the commonest tapeworm in Japan.

IJIMA & MURATA. Some new cases of the Occurrence of *Bothriocephalus liguloides*. T. c. pp. 149-162, pl. v bis.

The larva found in urethra, eye, and various tissues of man.

JOUBIN, L. (1) Sur un Némertien géant des côtes de France. Rev. Biol. i, pp. 458-460.

On a large specimen of *Cerebratulus marginatus*, with synonymy.

— (2) Sur la répartition des Némertes dans quelques localités des côtes de France. C.R. 1889, ii, pp. 231-233.

JOYEUX-LAFFUE, J. Sur le système nerveux des Chétopodes. Rev. Sci. xvi, p. 29.

A reply to Cosmovici. Assigns priority to Claparède; reasserts absence of dorsal and ventral anterior ganglia.

KELLCOTT, D. S. (1) Partial List of *Rotifera* of Shiawassee River at Corunna, Michigan. P. Am. Micr. Soc. 11th Ann. Meet. pp. 84-96, with woodcuts.

With 3 new species described and figured.

— (2) Additional Notes on certain Species of *Rotifera*. T. c. 10th Ann. Meet. pp. 181-186.

Chiefly a description of *Floscularia millsii*.

KNÜPFER, P. Female Genital Ducts of *Acanthocephala*. J. R. Micr. Soc. 1889, p. 519.

Abstract of paper cited in Zool. Rec. 1888.

KOWALEVSKY, A. Beitrag zur Kenntniss der Exkretionsorgane. Biol. Centralbl. ix, pp. 70-78; also *id.* pp. 127 & 128.

Nereis, *Lumbricus*, and *Hirudo* experimented on.

KÜCKENTHAL, W. Beiträge zur Fauna Spitzbergens. Resultate einer im Jahre 1886 unternommenen Reise. i Theil. Arch. f. Nat. 1889, i, pp. 125-168.

Spitzbergische Anneliden von Marenzeller, pp. 127-132. *Terebelloidea* von Meyer, pp. 183 & 184. Zur Kenntniss der Polynoiden von Spitzbergen Trauttsch, pp. 135-146, pl. iii, figs. 1-3, 1 new species. Opheliiden Kückenthal, pp. 147 & 148, with 1 new species. Neue parasitische Nematoden Cobb, pp. 149-151, pl. vii, figs. 4-10, with 3 new species.

KULAGIN, N. M. (1) K' faune *Oligochata* ostrychayushchikhsya v Roccii. [On the *Oligochata* found in Russia.] Izvest. Mosc. Univ. iv, pp. 142-148.

Names in Roman letters, rest in Russian. No new species.

— (2) Ueber einige im europäischen Russland und in Sibirien vorkommende Arten von Regenwürmer. Bull. Pétersb. (n.s.) i (xxxiii), pp. 181-190.

List of species, with descriptions; none new.

KULTSCHITZKY, N. Maturation and Fertilization of Ova in *Aecaris marginata*. J. R. Micr. Soc. 1889, pp. 223 & 224.

Abstract of paper cited in Zool. Rec. 1888.

1889. [VOL. XXVI.]

KÜNSTLER, J. Apropos du *Balanoglossus*. Bull. Soc. Z. Fr. xiv, p. 325.

Cassaigneau's paper stated to be an unauthorised publication from notes.

LEUCKART, R. Die Parasiten des Menschen. 2nd edition. Band 1, pt. 4, pp. 37-440, many woodcuts.

Trematodes continued.

LINDNER, G. (1) Mittheilungen über verschiedene parasitische Nematoden und die Rhabditis Formen derselben. Ber. Ver. Cassel, xxxv, pp. 43-47.

— (2) Studien über die Biologie und hygienische Bedeutung der im Essig lebenden Nematoden. CB. Bakt. Parasit. vi, pp. 633-638, 663-668, & 694-698.

Anguillula oxophila is a monogenous Rhabdite. It survives for a considerable time in albumen, urine, water, vegetables, &c. It is apparently not directly harmful to man, but may live for some time as a pseudo-parasite in the small intestine.

VON LINSTOW, — (1) Bericht ueber die wissenschaftlichen Leistungen in der Naturgeschichte der Helminthen im Jahre 1886. Arch. f. Nat. 1886, ii, heft iii, pp. 61-104. [Published in 1888, but omitted from Zool. Rec. 1888.]

— (2) Bericht ueber die wissenschaftlichen Leistungen in der Naturgeschichte der Helminthen im Jahre 1887. *Op. cit.* 1887, ii, pp. 1-60. [Published in Dec. 1889.]

Lists and papers, and review of helminthology in 1887.

— (3) On *Pseudalius alatus*, Leuckart, collected by Mr. Rob. Gray in the Arctic Seas, and other Species of the Genus. P. R. Soc. Edinb. xvi, pp. 15-17, pl.

— (4) Ueber die Entwicklungsgeschichte und die Anatomie von *Gordius tolosanus*, Duj., = *G. subbifurcus*, v. Siebold. Arch. mikr. Anat. xxxiv, pp. 248-268, pls. xiv-xvi. Abstract in J. R. Micr. Soc. 1890, pp. 40 & 41.

Anatomy of the larvæ from beetles, pp. 253-262. Anatomy of sexually mature adults, pp. 262-266. Gordians are related to the Chaetopods by the segmentation of the body and of the ovaries, by the double male organs and ventral nerve cord; while their development unites them with the Nematodes.

— (5) Bemerkungen über *Mermis*. Appendix to foregoing paper on *Gordius tolosanus*. T. c. pp. 390-396, pl. xxii. Abstract in J. R. Micr. Soc. 1890, p. 41.

A short account of *Mermis crassa* and *M. contorta*.

LINTON, E. Notes on Cestoid Entozoa of Marine Fishes. Am. J. Sci. xxxvii, pp. 239 & 240.

Abstract by author of Second Report on Fish Entozoa. *Phyllobothrium thysanocephalum*, elevated into a new genus, becomes *Thysanocephalum crispum*. *Rhynchobothrium tenuicolle*, Rud., is referred to new species *R.*

bulbifer. *R. bisulcatum* is put under Diesing's genus *Tetrarhynchobothrium*. *Acanthobothrium* of Van Beneden, placed under *Calliobothrium* by Diesing, is retained. New gen., *Rhinebothrium*, formed for *Echeneiobothria* with no myorhynchus. New family, *Gamobothriidae*, formed for unarmed *Tetrabothria* with the bothria united in a globe or disc. *Paratenia medusia*, n. g. & sp., has 16 flexible tentacular proboscides, which when extended form a crown of tentacles.* In *Rhodobothrium pulvinatum*, nervous system consisting of a square ganglion in the head, connected behind with two lateral cords, in front with four small ganglia.

LIPPITSCH, K. Beiträge zur Anatomie des *Derostoma unipunctatum*. Z. wiss. Zool. xlix, pp. 147-167, pl. viii, 1 woodcut. Abstract in J. R. Micr. Soc. 1890, p. 181.

A detailed anatomical and histological account.

LOMAN, J. C. C. Structure of *Bipalium*. J. R. Micr. Soc. 1889, pp. 226 & 227.

Abstract from paper cited in Zool. Rec. 1887.

LUKJANOW, S. M. Einige Bemerkungen über sexuelle Elemente beim Spulwurme des Hundes. Arch. mikr. Anat. xxxiv, pp. 397-408, pla. xxiii & xxiv. Abstract in J. R. Micr. Soc. 1890, p. 41.

An account of the sexual elements in an *Ascaris* from the Dog, probably *Ascaris marginata*.

MACMUNN, C. A. Contributions to Animal Chromatology. Q. J. Micr. Sci. xxx, pp. 51-96, pl. vi.

Worms, pp. 70-77. In *Phyllodoce* the pigment could not be referred to any class; it is to be called phyllodoce-green. In *Pontobdella* the green pigment is not chlorophyll. In *Chetopterus* there is chlorophyll; and in *Arenicola piscatorum* hæmoglobin and lipochromes.

MAN, J. G. DE. (1) Sur quelques Nématodes libres de la mer du Nord nouveaux ou peu connus. Mém. Soc. Zool. i, pp. 1-51, 4 pls. [Omitted from Zool. Rec. 1888.]

With *Halulaimus*, *Terschellingia*, *Aræolaimus*, *Dolicholaimus*, *Syringolaimus*, *Halichoanulaimus*, *Hypodontolaimus*, new genera, and 9 new species.

— (2) Espèces et Genres nouveaux de Nématodes libres de la mer du Nord et de la Manche. *Op. cit.* ii, pp. 1-10.

Cylicolaimus, n. g., *Azonolaimus*, n. g., *Thalassironus*, n. g., *Penzancia*, n. subg., *Camacolaimus*, n. g., *Desmodora*, n. g., *Monoposthia*, n. g., and 8 new species.

— (3) Troisième Note sur les Nématodes libres de la mer du Nord et de la Manche. *T. c.* pp. 182-216, 4 pla.

Contains further descriptions and figs. of some of the forms in Note II., and 3 new species.

* *Polypocephalus*, from the intestine of an E. Indian *Rhinocætis*, has been described by BRAUN (Arb. Inst. Würzb. iv, 1877-78) as having anterior extremity surrounded by 16 muscular tentacles (vide Jackson's *Formæ of Animal Life*).—P. C. M.

- [MAN, J. G. DE.] (4) Ueber zwei in der feuchten Erde lebende Art der gattung *Oncholaimus*. Tijdschr. Nederl. Dierk. Ver. (2) 1889, 162-169, pl. vi.

O. thalassophygus redescribed, with figs., and *O. lepidus*, n. sp., with figs.

- VON MARENZELLER, E. (1) Spitzbergische Anneliden. [Vide KÜCKENTHAL, *suprà*.]

— (2) Annulaten des Beringsmeeres. Ann. Hofmuseum Wien, pp. 1-8, pl. i.

List of *Vermes* and description of several species of Chaetopods; 2 pls.

- MAUPAS, M. Sur la multiplication agame de quelques Métazoaires inférieurs. C.R. 1889, ii, pp. 270-277. Abstract in J. R. Micr. Soc. 1889, p. 753.

Experiments on asexual reproduction in Rotifers and Oligochaetes.

- MENDTHAL, M. Untersuchungen ueber die Mollusken u. Anneliden des frischen Hafes. Schr. Ges. Königsb. xxx, pp. 27-42.

List of Annelids from brackish lakes; this fauna chiefly derived from fresh water. Account of genitalia in *Nereis*.

- MEYER, E. v. (1) Morphology of Annelids. J. R. Micr. Soc. 1888, pp. 385-387.

Abstract of paper cited in Zool. Rec. 1888. Genealogical tree given.

- (2) Terebelloidea. [Vide KÜCKENTHAL, *suprà*.]

- MICHAELSEN, W. (1) Die Gephyreen von Süd-Georgien—nach der Ausbeute der Deutschen Station von 1882-83. JB. Hamb. Mus. 1883, pp. 70-84, 1 pl.

On *Phascolosoma antarcticum*, n. sp., *P. fuscum*, n. sp., *P. georgianum*, n. sp., *Priapulius caudatus*.

- (2) Oligochaeten des Naturhistorischen Museums in Hamburg. T. c. pp. 1-17, pl. i.

On *Cryptodrilus purpureus*, n. sp., *Acanthodrilus australis*, n. sp., *Enchytraeus arenarius*, n. sp., *E. argenteus*, n. sp.

- (3) Oligochaeten des Naturhistorischen Museums in Hamburg. T. c. pp. 59-69, pl. ii.

On *Mandane picta*, n. sp., *M. hilgeri*, n. sp., *Cryptodrilus spatulifer*, n. sp.

- (4) Synopsis der Enchytraeiden. Abh. Ges. Hamb. xi, pp. 1-6, 1 pl.

With *Marionia*, n. g., *Henlea*, n. g., *Fredericia*, n. g. Analytic and phylogenetic tables and table of distribution are given.

- MICHEL, A. Sur l'épiderme des *Gordius*. Boll. Mus. Zool. Anat. Comp. Torino, iv, No. 59.

- MONIEZ, R. (1) Sur la métamorphose et la migration d'un Nématode libre (*Rhabditis oxyuris*). C.R. 1889, ii, pp. 506-507. Abstract in J. R. Micr. Soc. 1889, p. 756.

Young embryos attach themselves to an Acarine; secrete a large

anterior chitinous plate, and rest of body metamorphoses into an oval globule. The Acarines attach themselves to some dung-insect, and when the cake of cow-dung is dried up, Acarines, and with them the Nematode larvæ, are transferred to another cake. Possibly a second stage is passed through under the elytra of a *Geotrupes*.

[MONIEZ, R.] (2) Sur la métamorphose et la migration d'un Nématoïde libre (*Rhabditis oxyuris*). Rev. Biol. ii, pp. 126 & 127; also in C.R. 1889.

— (3) Sur un Strongle de la paroi stomacale des Lièvres et des Lapius de garenne. Rev. Biol. i, pp. 351-354.

Notes on the structure of *Strongylus leporum*.

— (4) Sur la larve du *Tania grimaldii*, n. sp., parasite du Dauphin. C.R. 1889, ii, pp. 825-827.

Cysticercus only known. Found on various Dolphins.

MONTICELLI, S. (1) Notes on some *Entozoa* in the Collection of the British Museum. P. Z. S. 1889, pp. 321-325, pl. xxxiii.

Various Trematodes, with 2 new species, and Cestodes, with *Pelichniobothrium*, n. g., from *Alepidosaurus*, and 5 new species.

— (2) Sul sistema nervoso dell' *Amphiptyches urna* Grube et Wagener. Zool. Anz. 1889, pp. 142-144.

Nervous system consists of two ganglia united by a commissure in the fore part of the body, and a pair of nerves running fore and aft.

— (3) *Gyrocotyle* Diesing—*Amphiptyches* Grube et Wagener. Atti Acc. Rom. 1889, i, pp. 228-230.

A preliminary note. *Amphiptyches* and *Gyrocotyle* are two distinct species of the genus *Gyrocotyle*. Genus *Gyrocotyle* is related to *Amphilina*.

— (4) Elenco degli Elminti raccolte dal Capitano E. Chierchia durante il viaggio di circumnavigazione della R. corvetta 'Vettor Pisano.' Boll. Soc. Nat. Napoli, iii, pp. 67-71.

With a new Cestode, Nematode, and Acanthocephalan.

— (5) *Ancyrocephalus paradoxus*, Creplin, e revisione del genere *Tetraonchus*, Diesing: nota preliminare. T. c. pp. 113-116.

— (6) *Tristomum uncinatum*, n. sp. T. c. pp. 117-119, pl. iv.

— (7) Di un Distoma dell' *Acanthias vulgaris*. T. c. pp. 132-134.

Preliminary note.

— (8) Breve Nota sulle uova e sugli embrioni della *Temnocephala chilensis*. Atti Soc. Ital. xxxii, pp. 125-133, pl. v.

NEAL, J. C. The Root-Knot Disease of Peach, Orange, and other Plants in Florida due to the work of *Anguillula*. Bull. Dep. Agric. Ent. No. 20, 1889, 31 pp., 21 pls.

Au account of the pathological changes in the plants, experiments with various remedies, and a sketch of the life-history of *Anguillula*.

NUNN, J. P. Note on a Turbellarian Worm. *Sci. Goss.* 1889, pp. 203 & 204, woodcut.

PACKARD, A. S. The Cave Fauna of N. America, with remarks on the Anatomy of the Brain and Origin of the Blind Species. *Mem. Nat. Ac. Sci.* iv, pp. 3-156, 27 pls.

Vermes, pp. 27 & 28. 2 Turbellarians, with woodcuts.

PARONA, C. (1) *Elmintologia italiana* (Bibliografia Sistemática e Storia). *Boll. Scient.* xi, pp. 62-64.

—, (2) *Elmintologia italiana* (Bibliografia Sistemática e Storia). (Continuation.) *T. c.* pp. 93-96.

—, & PERUGIA, —. *Mesocotyle squillarum*, n. subg., n. sp. di Trematode ectoparassita del *Bopyrus squillarum*. *T. c.* pp. 76-80, 1 pl.

PAVESI, P. Quadro sinottico delle Tenie umane. *T. c.* pp. 57-60, with a table of human Cestodes.

PINTNER, I. Neue Untersuchungen über den Bau des Bandwurmkörpers. *Arb. z. Inst. Wien.* viii, 3, pp. 1-50, 3 pls. Abstract in *J. R. Micr. Soc.* 1890, pp. 183 & 184.

i. On the genus *Echinobothrium*; description of 2 new species, and of the anatomy and histology of the group.

PLATE, L. H. Ueber die Rotatorienfauna des baltischen Meerbusens, nebst Beiträge zur Kenntniss der Anatomie der Philodiniden und der systematischen Stellung der Räderthiere. *Z. wiss. Zool.* xlix, pp. 1-42, pl. i. Abstract in *J. R. Micr. Soc.* 1890, pp. 185 & 186.

4 new species are described. In *Rotifer vulgaris* the thread from the posterior end of the genital gland to the intestine is a rudimentary oviduct. There is no uterus; the embryos bore into the cloaca from the body cavity and escape by the anus. The anatomy of *Callidina* is fully treated, pp. 29-41; relations of Rotifers and the Trochosphere theory are discussed:—

	{	<i>Hexarthra</i> . . .	<i>Crustacea</i> .
<i>Trochophora = Rotatoria</i>		<i>Annelides</i> . . .	{ <i>Echiuri</i> , <i>Hirudinei</i> .
		<i>Platodes</i> .	{ <i>Tardigrada</i> . . . <i>Tracheata</i> .
		<i>Mollusca</i> .	
		<i>Bryozoa</i> .	

PLESSIS, E. DU. (1) Note sur *Otoplana intermedia*. *Zool. Anz.* 1889, pp. 339-342. Abstract in *J. R. Micr. Soc.* 1889, p. 643.

O. intermedia, n. g. & sp. of marine Triclad, is blind; has an octocyst, and ciliated pits like those in Nemertines. Alimentary canal is arborescent, and there is a single generative aperture. It is intermediate between Dendrocoelea and Rhabdocoele.

—, (2) Sur le *Monotus setosus*, n. sp. *Zool. Anz.* 1889, pp. 626-630, woodcut.

Completes the transition formed by *Otoplana*.

- RAILLIET, A. (1) Sur l'identité du *Strongylus blasii* von Linstow et du *Strongylus strigosus*, Dujardin. *Op. cit.* xiii, pp. 210-214.
- (2) De l'occurrence de la filaire de médine chez les animaux. *Op. cit.* xiv, pp. 73-76, woodcuts.
- (3) Recherches expérimentales sur les Tumeurs vermineuses du foie des Muridés. *T. c.* pp. 62-68.
- Experiments with the eggs of various Nematodes and Tænias.
- (4) Développement expérimental du *Strongylus strigosus*, Duj., et du *Strongylus retortaeformis*, Zeder. *T. c.* pp. 375-377.
- , & LUCET, —. (1) Sur la présence du *Trichosoma contortum* Creplin chez le Canard domestique. *Bull. Soc. Z. Fr.* xiv, pp. 382 & 383.
- & —. (2) Tumeurs vermineuses du foie du Hérisson, déterminées par un Trichosome. *T. c.* pp. 360-362.
- On *Trichosoma exiguum* in *Erinaceus*.
- RAKE, B. Sudden Death from Ankylostomiasis. *Brit. Med. J.* 1889, ii, p. 656.
- Occurred in Trinidad ; no marked anæmia was present.
- RIVIÈRE, E. Pathologie Végétale. *Rev. Sci.* xvi, pp. 68 & 713.
- Tylenchus* and *Heterodera* in beetroot and potato.
- ROSA, D. (1) Il *Ctenodrilus pardalis*, Clap., a Rapallo. *Boll. Mus. Zool. Anat. Comp. Torino*, iv, No. 69.
- (2) Sulla struttura della *Hormogaster redii*. *Mem. Acc. Tor.* xxxix, pp. 49-60, 1 pl.
- A zoological and anatomical account of this Oligochaete.
- (3) New genus of *Eudrilidæ*. Indian *Perichatidæ*. *J. R. Micr. Soc.* 1889, p. 220.
- Abstract of papers quoted in *Zool. Rec.* 1888.
- (4) Descrizione dell' *Allolobophora mima*, n. sp. *Boll. Mus. Zool. Anat. Comp. Torino*, iv, No. 60.
- (5) Note sui *Lombrichi iberici*. *Op. cit.* No. 63.
- With 1 new species.
- (6) Sull' assenza dei Receptacula seminis in alcuni Lumbricidi. *Op. cit.* No. 71.
- (7) *Lombrichi antartici* e *Lombrichi* di Nias (Sumatra). *Op. cit.* No. 73.
- ROULE, L. (1) Development of Cœlome in *Enchytraides marioni*. *J. R. Micr. Soc.* 1889, p. 387.
- Abstract of paper cited in *Zool. Rec.* 1888.
- (2) Le développement du système nerveux des Annélides et l'influence exercée sur lui par la symétrie du corps. *C.R.* 1889, i, pp. 359-361. Abstract in *J. R. Micr. Soc.* 1889, p. 514.
- First appearance is a cephalic plate only. This occurs in forms with abbreviated development. In free larvæ there is as well a network

under the oral ring of cilia. Next arises a medullary plate in the mid-ventral line of the metasoma, and from this is formed the ventral chain. At first these are oval or circular; thicker in the middle. They are epiblastic. When the mesoblast appears this primitive radial symmetry becomes bilateral by paired proliferations from the two nervous plates.

- [ROULE, L.] (3) Études sur le développement des Annélides et en particulier d'un Oligochaète limicole marin (*Enchytraeoides marioni*). Ann. Sci. Nat. vii, pp. 107-442, with many woodcuts and 15 plates. Abstract in J. R. Micr. Soc. 1890, pp. 37-39.

An elaborate account of the embryology of this form, with discussion of the embryology of Annelids generally, and of many problems in comparative embryology. A table of *Trochozoaria* and their descendants is given.

- ROUSSELET, C. (1) Note on *Brachionus quadratus*, a new Rotifer. J. Quek. Club, iv, pp. 32 & 33, pl. iv.

New species found in Epping Forest.

- (2) Note on a New Rotifer "*Limnias cornuella*." Op. cit. iii, pp. 337 & 338, pl. xxiv.

New species found in a hot-house tank at Regent's Park.

- SAINT-JOSEPH, F. DE. *Polychaeta* of Dinard. J. R. Micr. Soc. 1889, p. 55.

Abstract of paper quoted in Zool. Rec. 1888.

- SAINT-LOUP, R. (1) *Polyodontes maxillosus*. Translation in Ann. N. H. 1883, ii, p. 332.

- (2) Sur le *Polyodontes maxillosus*. C.R. 1889, ii, pp. 412-414. Abstract in J. R. Micr. Soc. 1889, p. 754.

Animal, 2 mètres long, found in the Gulf of Marseilles.

- SCHNEIDER, R. Ueber Eisen-Resorption in thierischen Organen u. Geweben. Abh. Ak. Berl. 1888.

Vermes, pp. 12-19.

- SHAW-MACKENZIE, J. A. Tapeworm in an Infant on raw meat Diet. Brit. Med. J. 1889, i, p. 16.

Tania mediocanellata.

- SHIMKEVICH, V. M. O soomnoshenii *Enteropneusta* k' drughijm *Metazoa*. (On the relations of the *Enteropneusta* to other *Metazoa*.) Trudni St. Petersburg Nat. xx, pp. 39-45.

A short review of the various opinions about the affinities of *Balanoglossus*. (Russian only; but contains no new matter.)

- SHIPLEY, A. E. On *Phymosoma varians*. P. R. Soc. xlvi, pp. 122-126. Abstract in J. R. Micr. Soc. 1889, pp. 642 & 643.

Head has an extensible collar. There is a skeletal tissue of round cells, with large nuclei, in the collar and tentacles. Nephridia and nervous system are described. Resemblance to *Phoronis* is insisted on.

SIBTHORPE, C. On *Filaria sanguinis hominis*. P. R. Irish Ac. series 3, i, pp. 202-205, pl. xiv.

Descriptions of male and female with figs.

SONSINO, P. Nematode in blood of a Dog. J. R. Micr. Soc. 1889, p. 58.

Abstract of paper cited in Zool. Rec. 1888.

SOULIER, A. Sur la structure de l'épiderme chez les Serpuliens. C.R. 1889, i, pp. 460-463. Abstract in J. R. Micr. Soc. 1889, p. 515.

The epiderm has two layers, and in both are mucous secreting cells in alveoli, surrounded by non-mucous cells.

SPENCER, W. B. (1) Anatomy of *Megascolides australis*. J. R. Micr. Soc. 1889, p. 216.

Abstract of paper quoted in Zool. Rec. 1888.

— (2) On the presence of a Fluke in the Egg of a Fowl. P. R. Soc. Vict. i, pp. 109 & 110.

The flukes live in the bursa fabricii of fowls, and on rare occasions travel up the oviduct and become entangled in the albumen of the egg.

STEDMAN, J. M. The Tapeworm. P. Am. Micr. Soc., 10th Ann. Meet., pp. 243-245, with woodcut.

A method of injecting and mounting.

ŠTOLC, A. O pohlavních organech rodu *Æolosoma* a jejich poměrně ku organum exkrecnim. SB. böh. Ges. 1889, pp. 183-194, pl. vii.

On the structure of *Æolosoma*—specially on the excretory organs. (In Bohemian only.)

STOSSICH, M. Brani di Elmintologia Tergestina. Boll. Soc. Adr. xi, pp. 23-30, pls. xiii & xiv.

Descriptions of new *Distomidae*, with figs.

STUDER, TH. Die Forschungsreise S.M.S. 'Gazelle' in der Jahren 1874 bis 1876. III. Theil. Zool. u. Geol. 322 pp., 33 pls.

Lists of results of dredging at different places are given, and there is one plate (xxvii) on *Chatopoda*. Reprinted, Arch. f. Nat. xxiv, heft. i, Taf. v.

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The relations of Molluscs to *Vermes* are discussed.

THOMAS, A. P. Parasitic Diseases affecting Rabbits in the Wairarapa District. Government Report, New Zealand, 1889, 14 pp., 2 pls.

Contains observations and experiments on parasitic diseases of Rabbits, chiefly on *Cenurus serialis*, *Tænia serialis*, *Cysticercus pisiformis*. The bladder worm may be usefully employed against the rabbit pest; but it will destroy only a small percentage of the rabbits in the district. The figures exhibit the development and adult structure of the parasites dealt with.

THOMAS, DAVIES. Laparotomy for Hydatid of the Liver. Brit. Med. J. 1889, ii, pp. 727 & 728.

THORPE, V. G. (1) Description of a New Species of *Megalotrocha*. J. R. Micr. Soc. 1889, pp. 613-616, pl. xii.

Megalotrocha semibullata, n. sp., with figs., from Brisbane, Queensland.

— (2) A List of Queensland *Rotifera*. P. R. Soc. Queensl. vi, pp. 70-75.

— (3) On certain *Rotifera* found in the ponds of the Gardens of the Acclimatisation Society, Brisbane. *Op. cit.* iv, pp. 28-30.

TOULA, F. Geologische Untersuchungen im Centralen Balkan. Denk. Ak. Wien, lv, 108 pp., with maps, woodcuts, and 8 palæontological plates.

Contains account and figs. of a new *Serpula* (p. 81).

TRAIL, J. W. H. Large Earthworm from Amazonia. *Nature*, xxxix, p. 437.

TRAUTZSCH, H. (1) Zur Kenntniss der Polynoiden von Spitzbergen. [*Vide KÜKENTHAL, suprd.*]

— (2) Beitrag zur Kenntniss der Polynoiden von Spitzbergen. Jen. Z. Nat. xxiv, pp. 61-104, pls. ii & iii.

Description of species and special account of the nephridia.

VANLAIR, C. Un nouveau cas de bothriocéphalie en Belgique. Bull. Ac. Belg. 1889, pp. 379-406.

VAYSSIÈRE, A. Atlas d'Anatomie Comparée des Invertébrés. Paris: O. Dorin, 1890. Vol. i, text; vol. ii, plates.

Pls. xli-li, *Vermes*.

VEJDOVSKÝ, F. Poznámky vývojèpisné. SB. böhm. Ges. 1889, pp. 164-182, pls. v & vi.

On the early development of some Worm—apparently a Chaetopod. (In Bohemian only.)

VILLOT, A. (1) Sur l'hypoderme et le système nerveux périphérique des Gordiens. C.R. 1889, i, pp. 304-306. Abstract in J. R. Micr. Soc. 1889, p. 388.

Reply to Michel [cited Zool. Rec. 1888]. He has never denied existence of a cellular hypoderm in young, nor locally in adults. These cells produce by secretion the adult cuticle, and in the adult their cell outlines may disappear. The peripheral nervous system consists of a network of ganglion cells in connection with the hypodermis.

— (2) Sur l'ovogenèse, la structure de l'ovaire, et la régression du parenchyme des Gordiens. C.R. 1889, ii, pp. 411 & 412. Abstract in J. R. Micr. Soc. 1889, p. 755.

Ovaries are long paired tubes, blind anteriorly, posteriorly ending in the oviducts. Ova are formed in branched pouches of the wall of the ovarian tubes, and on maturity enter the tubes.

[VILLOT, A.] (3) Sur la signification histologique, le mode de formation et l'usage de la cavité péri-intestinale des Gordiens. *Op. cit.* i, pp. 685-687. Abstract in J. R. Micr. Soc. 1889, p. 388.

The cavity is formed by the fatty degeneration and subsequent absorption of the parenchymatous mesoblast cells. When the Gordians have left their host, they utilize as food the part of their mesoblast not transformed into definite organs.

VOGT, C., & YUNG, E. *Traité d'Anatomie Comparée pratique*. Paris: 1888. Tome I.

Vermes, pp. 200-513, with elaborate descriptions and figures of the anatomy of *Arenicola piscatorum*, *Ascaris lumbricoides*, *Brachionus pala*, *Distomum hepaticum*, *Hirudo medicinalis*, *Lumbricus agricola*, *Mesostomum ehrenbergii*, *Sipunculus nudus*, *Tenia solium*, *Tetrastemma flavidum*.

VORCE, C. M. Note on a new Rotifer—*Gamphogaster arcolatus*. P. Am. Micr. Soc. 10th Ann. Meeting, pp. 250-252, pl.

From Cleveland, Ohio.

WAGNER, F. VON. Zur Kenntniss der ungeschlechtlichen Fortpflanzung von *Microstoma*. Zool. Anz. 1889, pp. 191-195. Abstract in J. R. Micr. Soc. 1889, p. 388.

WEBER, E. F. Notes on some *Rotifera* from the Neighbourhood of Geneva. J. R. Micr. Soc. 1889, pp. 59 & 60.

Abstract of paper cited in Zool. Rec. 1888.

WILSON, E. B. The Embryology of the Earth-Worm. J. Morph. iii, pp. 387-462, 7 pls.

A full account of the development, based on study of *Lumbricus terrestris*, *Allobophora cyanea*, and *A. fetida*. Among the special points noted are:—(1) Unequal and variable cleavage, and embolic gastrula. (2) Derivation of all the mesoblast from a pair of primary mesoblast cells (teloblasts). (3) Germ bands consist of three layers—an outer (ectoblast) giving rise to hypodermis; a middle (ectoblast) giving rise to the nervous system, outer part of the nephridia, setigerous glands and setae [Kleinenberg thought this mesoblastic, and so partly based his theory of the mesoblast upon erroneous observation]; an inner (mesoblast) entirely derived from the teloblasts and giving rise to the muscles, blood vessels, dissepiments, peritoneal epithelium, reproductive organs, and inner part of the nephridia.

WIRÉN, A. Om blodet och blodomloppet hos *Glycera alba*. Biol. fören. ii, pp. 32-37.

On the blood and circulation of *Glycera*.

WHITEAVES, G. F. Contributions to Canadian Palæontology. Vol. I., pt. 2. Montreal: 1889, with pls.

Vermes from Hamilton formation of Ontario, p. 122. *Vermes* from Cretaceous of Manitoba, 1 new species.

WHITELEGGE, T. Notes on a Method of Killing Zoophytes and *Rotifera*. Tr. Manch. Micr. Soc. 1888, pp. 14 & 15.

WHITMAN, C. O. Some New Facts about the *Hirudinea*. *J. Morph.* pp. 586-599. Abstract in *J. R. Micr. Soc.* 1889, pp. 516-518.

The *Hirudinea*, as a group, have sense organs on the first ring of every somite. Metamerism is typical of this group; a diffuse condition secondary. Eyes are segmental sense organs. Labial sense organs, ventral segmental sense organs. Probably all leeches have eyes. Visual cells not pigment are test of eye in leeches. Segmental organs are both tactile and visual. They supply most important index to the metamerism. They may be related to lateral line organs, &c., of Vertebrata. Many other points are discussed.

ZACHARIAS, O. Bericht über eine zoologische Exkursion an die Kratzen der Eifel. *Biol. Centralbl.* ix, pp. 56-64, 76-80, & 107-113.

Faunal lists and conclusions.

ZELINKA, C. Die Gasterotrichen. Eine monographische Darstellung ihrer Anatomie, Biologie, u. Systematik. *Z. wiss. Zool.* xlix, pp. 209-384, pls. xi-xv, 10 woodcuts. Abstract in *J. R. Micr. Soc.* 1889, p. 189.

An elaborate monograph of the group. *Lepidoderma*, n. g., *Gossypium*, n. g., and 3 new species. In the general part, pp. 358-379, the history of the group is related, and the group is defined: Without anterior retractile vibratile disk; with two ventral ciliated bands; with two twisted water canals, bearing long rod-like ciliated lappets, and opening separately on the median ventral surface; with a simple cerebral ganglion, partly in the ectoderm; with simple muscle cells, paired ovaries, fore-gut muscular, nematode like, devoid of jaws; mid-gut not glandular, hind gut pear shaped; anus and rectum dorsal; body cavity = persistent segmentation cavity. They are related to the *Rotifera*, but have Nematode affinities. The name "*Trochelminthes*" is suggested for them.

ZOGHRÁF, N. YU. Stroenie puznirchatoi formui y *Gymnorhynchus reptans*, Rud. *Izvest. Mosc. Univ.* vol. 4, pp. 259-284, with many figs.

An elaborate histological and anatomical account of the cystic stage of *Gymnorhynchus reptans*. [Russian only.]

ZOFF, O. Ueber einen Nematoden fangenden Schimmelpilz. *Biol. Centralbl.* viii, pp. 705-707.

Arthrobotys oligospora captures small Nematodes (*Tylenchus*, &c.) in its meshworks, kills them by its hyphae, and uses them for nutrition.

ZSCHOKKE, F. (1) Recherches sur la Structure anatomique et histologique des *Cestodes*. *Mem. Inst. Genev.* xvii, pp. 1-396.

Anatomy of *Tenia mamillana*, *T. transversaria*, *T. diminuta*, *T. relicta*, n. sp., with figs., *T. expansa*, *Idiogenes otidis* and *Tenia litterata*, *T. canaliculata*, *T. lagopodis*. The presence of a rudimentary digestive apparatus (p. 156) is described; phylogenetic conclusions and a classification of the *Tenias* are given, pp. 160-172. Anatomy of *Callibothrium coronatum*, *C. leuckartii*, *C. verticillatum*, *C. filicollis*, n. sp., *Acanthobothrium*, *Onchobothrium*, *Scolecobothrium*, *Anthobothrium auriculatum*, *A. cornucopiae*, *Monorygmum*.

perfectum, *Tetrabothrium crispum*, *T. longicolle*, *Phyllobothrium thridax*, *P. dohrni*, *Orygmatobothrium longicolle*, n. sp., *Echeneibothrium gracile*, n. sp., *E. myliobatis*, *Cephalocotyleum squali*. General conclusions and criticisms of Moniez, pp. 369-380.

[ZSCHOKKE, F.] (2) *Spiroptera alata*, ein neuer Nematode aus Rhea americana. CB. Bakt. Parasit. pp. 792-794.

S. alata, n. sp.

ZSCHOKKE, F., & EISIG, H. *Vermes*. Zool. JB. 1888, 73 pp.

List of articles in periodical and separate publications, pp. 1-12.
Abstracts and general accounts, pp. 12-73.

III.—REFERENCES. SYSTEMATIC CLASSIFICATION.

GENERAL.

Review of literature for 1884-85; BRAUN (6).

Review of helminthology for 1886; VON LINSTOW.

Review of literature on free-living *Vermes* for 1886-87; BRAUN (7).

Review of helminthology for 1887; VON LINSTOW (2).

Summary for 1888; ZSCHOKKE & EISIG.

Text-book; ECKSTEIN.

List from Behring Seas; MARENZELLER (2).

Characteristic deep-sea Worms; AGASSIZ.

Preliminary advertisement; PARONA (1).

Italian helminthology: literature (continued) *id.* (2).

ROTIFERA.

Review of literature, 1882-86; DEWITZ.

Contractile vesicle; COSMOVICI.

Method of killing; WHITELEGGE.

Notes on various forms; KELLICOTT (1, 2).

Supplement to monograph; HUDSON & GOSSE.

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Distribution: habitat, &c.; HUDSON (1, 2).

From Geneva; WEBER.

List from Greenland; GUERNE & RICHARD.

Asplanchna amphora, n. sp., with figs.; HUDSON & GOSSE.

Asplanchna syringoides, n. sp.; PLATE.

Brachionus pila: anatomy with figs.; VOGT & YUNG.

Brachionus quadratus, n. sp., with figs.; ROUSSELET (1).

Callidina raga: agamic reproduction; MAUPAS.

Callidina magna, n. sp., with figs.; PLATE.

Cycloglena lupus: agamic reproduction; MAUPAS.

Distyla flexilis, with figs.; BURN.

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Floscularia (Stephanoceros) milleti; *id.* (2).

- Gamphogaster areolatus*, n. sp., with figs. ; VORCE.
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Limnias cornuella, n. sp., with figs. : ROUSSELET (2).
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- Terrestrial Nemertines : habits of, with a description of an ~~adult~~
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Chaetonotus brevispinosus, n. sp., with fig., *C. macrochaetus*, n. sp., with
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Anoplostoma blanchardi, n. sp., with fig. ; DE MAN (1).
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Ascaris bulbosa, n. sp., COBB (1).
Ascaris kükenenthalii, n. sp., with figs. ; *A. bulbosa*, n. sp., with figs. ; *id.* (2).
Ascaris lumbricoides : anatomy, with figs. ; VOGT & YUNG.
Ascaris : integument ; CAMERANO (4).
Ascaris : sexual elements, with figs. ; LUKJANOW.
Aronolaimus, n. g. ; *A. filiformis*, n. sp. ; DE MAN (2).
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Chromadora microlaima, n. sp., with figs. ; *id.* (3).
Cylicolaimus, n. g. ; *C. magnus* ; *id.* (2).
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Dolicholaimus, n. g. ; *D. marioni*, n. sp., with fig. ; *id.* (1).
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Meloidogyne exigua, GÖLDI.
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Monohystera oryzerca, n. sp., with fig. ; *id.* (1).
Monoposthia, n. g., *id.* (2).
Oncholaimus brachycercus, n. sp., *id.* (2).
Oncholaimus lepidus, n. sp., with figs. ; *O. thalassophygus*, with figs. ; *id.* (1).

Penzancia, n. subg.; DE MAN (2).

Pseudalius alatus; anatomy, with figs.; VON LINSTOW (3).

Rhabditis oxyuris; metamorphosis; MONIEZ (1).

Spiroptera paradoxa, n. sp., with fig.; DE MAN (2).

Spiroptera alatata, n. sp., ZSCHOKKE (2).

Strongylus arcticus, n. sp., with fig.; COBB (1). *S. blasii* *ide* with *S. strigosus*; RAILLIET (1). *S. leporum*: anatomy; MONIEZ. *S. retortiformis* and *S. strigosus*: experimental development; RAILLIET (4).

Syringolaimus, n. g., *S. striatocaudatus*, n. sp., with figs.; DE MAN.

Terschellingia, n. g.; *T. communis*, n. sp., with fig.; *id.* (1).

Thalassironus, n. g.; *T. brittanicus*, n. sp.; *id.* (2).

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Trichina: vitality; GIBIER.

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Acanthodrilus: relations, with genealogical tree; BEDDARD (4).

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Acanthodrilus dissimilis, with fig.; BEDDARD (6).

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- Æolosoma quaternarium* : pigment ; *id.* (2).
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Citellio. Anatomy ; systematic position ; BEDDARD (3).
Cryptodrilus canaliculatus, n. sp., *C. fustigatus*, n. sp., *C. illawarræ*, n. sp., *C. manifestus*, n. sp., *C. mediocris*, n. sp., *C. mudgeanus*, n. sp., *C. oxleyensis*, n. sp., *C. singularis*, n. sp., *C. sloanei*, n. sp., *C. tenuis*, n. sp., *C. unicus*, n. sp. ; FLETCHER.
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Dero : sexual organs ; BEDDARD (9).
Digaster perrieri, n. sp. ; FLETCHER.
Diplocardia communis ; GARMAN.
Earthworm : embryology ; WILSON.
Large Earthworm from S. America ; TRAIL.
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Lumbricus : muscles and integument ; CERFONTAINE.
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Marionia, n. g. ; *id.* (4).
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Perichæta attenuata, n. sp., *P. enormis*, n. sp.,
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COELENTERATA.

BY

DR. S. J. HICKSON.

LIST OF PAPERS.*

1. °AGASSIZ, L., & FEWKES, J. W. The anatomy of *Astrangia danae*. Six lithographs from drawings by A. SOUREL. Natural History illustrations prepared under the direction of LOUIS AGASSIZ, 1849. Explanation of plates (20 pp., 4to), by J. WALTER FEWKES. Published by the Smithsonian Institution, 1889.
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 3. °AMICIS, G. A. DE. Altri calcari ad *Ellipsactiniae* nella provincia di Salerno. Atti (Mem.) Soc. Tosc. (proc. verb.) vi, pp. 238 & 239.
 4. BARKER, D. WILSON. Currents and Coral reefs. Nature, xxxix, p. 389.
 5. BARROIS, C. Faune du Calcaire D'Ebray. Contribution à l'étude du terrain devonien de l'ouest de la France. Mém. Soc. Géol. du Nord. iii, 1889, 384 pp., 3 pls. of *Cœlenterata*. Abstr. in Geol. Mag. 1889, p. 277.
 6. BEDOT, M. Procédés de conservation des animaux marins inférieurs. Arch. Sci. nat. (3) xxi, 6, pp. 556-558.
 7. BELL, F. J. Descriptions of some new or rare species of Plexaurids. P. Z. S. 1889, i, pp. 47-49, 1 pl.
 8. BÉTENCOURT, A. Les Hydraires du Pas-de-Calais. Bull. Sci. Fr. Belg. i, p. 201.
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- . [Vide C. DARWIN, *infra*.]

* An asterisk prefixed to a quotation indicates that the Recorder has not seen the journal or work referred to.

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11. BOVERI, T. Ueber Entwicklung und Verwandtschaftbeziehungen der Aktinien. Z. wiss. Zool. pp. 461-503, 3 pls.
12. BROOK, G. New type of Dimorphism in *Antipatharia*. P. R. Soc. Edinb. xv, pp. 78-81. Abstr. in J. R. Micr. Soc. 1889, pt. 6, p. 764.
13. —. Report on the *Antipatharia* collected by H.M.S. 'Challenger'. Rep. Sci. Res. Voyage H.M.S. 'Challenger,' xxxii, 222 pp., 15 pls.
14. CHUN, C. *Celetterata* (commenced). Bronn's "Klassen u. Ordnungen," vol. ii, pt. 2, pp. 1-48.
15. —. Bericht über eine nach den Canarischen Inseln im Winter 1887-8 ausgeführte Reise. S.B. Ak. Berlin, 1889, pp. 524-526, 1 pl. Abstr. in J. R. Micr. Soc. 1890, pt. 1, p. 46.
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ANATOMY AND PHYSIOLOGY.

1. ANATOMY.

GENERAL.

A comprehensive account of the structures of the hard parts, and classification of *Cœlenterata*, will be found in NEUMAYR'S text-book (74).

HYDROZOA.

DRIESCH (25) gives a long account of the plan of construction of the branching colonies of many forms of Sertularian and Campanularian Hydroids.

WAGNER (91) gives an account of the anatomy of the interesting Hydrozoon *Monobrachium parasiticum*. The gonophore is in the form of an almost complete medusa, its blind gastric sac having the form of a spadix containing a small cavity.

LOMAN (61) describes the anatomy of the fused and anastomosing cœnosarcial tubes of *Plumularia*, *Corydendrium*, *Antennularia*, &c., and shows that they belong to various categories. The anatomy of the interesting new species *Amalthæa vardöensis* is described, and it is shown that strobilisation appearances may occur in Hydroid polyps as well as in Scypho polyps.

HAECKEL (43), in describing several new Hydroids symbiotic with the deep-sea *Keratorsa*, states that the following characters are common to all these symbiotic Hydroids: (1) the enormous development of a reticular hydrorhiza; (2) the small size of the hydranth arising from it; (3) the production of sporosacs, or sessile gonophores; (4) the production of a dark brown or greenish pigment in the entoderm cells.

MINCHIN (69) shows that the capsules in which the embryos of *Aurelia aurita* are found are formed as simple evaginations of the groove of the oral arms.

SCHEWIAKOFF (80) gives the results of some important investigations on the anatomy of the eyes and eye-spots of the *Acalephæ*. Preserved specimens of *Charybdea*, *Aurelia*, *Cyanea*, *Rhizostoma*, and *Pelagia* were examined.

FEWKES (31, 32) describes several new Hydroids from California.

FEWKES (29) describes the anatomy of *Angelopsis*, and discusses its 1889. [VOL. XXVI.]

supposed affinities with Haeckel's genus *Auralia*. The same author (30) gives a good account of *Athorybia californica*, n. sp., and (31) describes new species of *Veleva* (*meridionalis*).

ANTHOZOA.

HADDON (41) gives a very complete revision of the British Anemones, describing 1 new genus (*Paraphellia*) and 3 new species. His memoir contains an important chapter on our knowledge of the development of the *Actiniae*.

G. Y. & A. F. DIXON (22) give an account of the colour, natural history, and structure of *Bunodes thallia*, *B. verrucosa*, and *Tealia cornis*. G. Y. DIXON (23) remarks on the colour, form, dimensions, and distribution of *Sagartia venusta* and *S. nivea*. A. F. DIXON (24) gives diagrams of the arrangement of the mesenteries in the genus *Sagartia*.

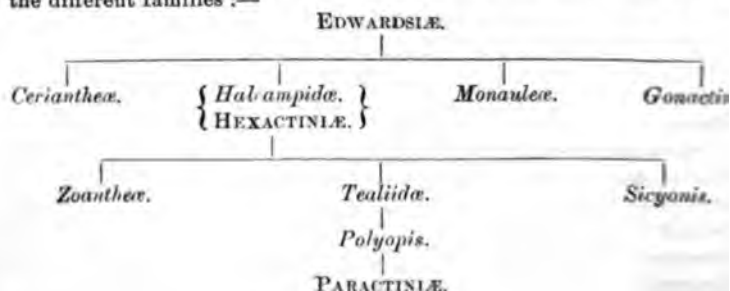
CUNNINGHAM (17) gives a description of *Tealia tuberculata* (Cocks), and maintains that it is synonymous with *Bolocera eques* of Gosse.

FISCHER (34) remarks that the bilateral symmetry of *Cerianthus* is shown in the seriation of the buccal tentacles; the marginal tentacles, on the other hand, exhibit a radial symmetry. In another memoir (37) the author gives an account of the structure of *Cerianthus membrana*, *Sagartia viduata*, and several other species from the French coasts.

SCHULTZE (82) believes that the new genera *Fenja* and *Aegir* (Zool. Rec. 1888, *Cæl.* p. 32) were established from injured specimens. To DANIELSSEN (19) replies that he is an experienced fisherman, and cannot have made such a mistake.

DANIELSSEN (18) gives a full description of the structure of *Cerianthus borealis*.

BOVERI (12) describes the structure of certain larval stages of the genus *Arachnis*, of *Cereactis aurantiaca*, of an *Edwardsia*, and some other undetermined forms. He considers that the eight ventral mesenteries of *Cerianthus* are homologous with the eight mesenteries of *Edwardsia*; in other words, that the *Cerianthus* type of Anemone has been derived from the *Edwardsia* type by the introduction of new pairs of mesenteries between the dorsal pair. In a similar manner, the *Hexactinia*, *Monactinia*, and *Zoanthæ* may be derived from the *Edwardsia* type by the interposition of new pairs between the primary eight pairs of mesenteries. The following scheme illustrates the supposed origin of the different families:—



DENDY (21) mentions the occurrence of *Anemone* larvæ (*Halcampa*? sp. ?) parasitic on *Desmonema* sp. ?.

DURÉGNE (27) gives a note on the structure of *Chitonactes richardi*.

McMURRICH describes the structure of many species of *Anemones* from the Bermudas (66) and Bahamas (65). He proposes (67) to establish a fourth sub-tribe, *Dendromelineæ*, which would include *Lebrunia* and probably *Ophioliscus*. The same author (68) records the occurrence of an *Edwardia* stage in the free-swimming embryos of *Aulactinia stelloides*.

WILSON (93) found that in a *Cereactis bahamensis* (= *Condylactis passiflora*) the walls of the œsophagus had so grown together that the two circular openings of the siphonoglyphes were the only two communications with the gastrovascular cavity. A similar condition was found in the free-swimming larvæ of *Manicina areolata*.

BROOK (12, 13) gives a very full account of the anatomy of the *Antipathidæ*, and calls attention to an interesting form of dimorphism that is met with in some genera of this group. The three lobes of the zooid in *Parantipathes* become separated in *Schizopathes* by the formation of vertical mesogloæal partitions, and thus three distinct and separate zooids are formed, the central one being a gastrozooid and the lateral ones gonozooids.

VON KOCH (55) gives an account of the anatomy of the *Antipathidæ* of the Bay of Naples.

ORTMANN (77) describes several new species of Corals from Ceylon, and discusses the classification, the nomenclature of the parts, phylogeny, and geographical distribution of the *Madreporaria*.

HICKSON (48) gives a brief account of the anatomy of a typical (perforate and imperforate) Coral.

VON KOCH (53), in describing the anatomy of *Caryophyllia rugosa*, observes that it is an interesting example of a Coral that is regularly eight-rayed in the adult condition, being only six-rayed in the younger stages.

ORTMANN (78), in describing *Cylicia tenella*—a modern Rugose!—maintains that the bilateral arrangement of the septa is the normal one, and that it is only by powerful lateral pressure of the calyx that an irregular radial structure is produced. It seems probable that a bilaterally symmetrical structure is a primitive character of the Stony Corals which they have inherited from free-swimming ancestors, and that this structure has been modified in later Corals by the fixed habits and tendency to form colonies.

FOSSIL CORALS.

BARROIS' (5) memoir is an important contribution to our knowledge of the Devonian Corals.

HULL (50), and the other officers of the Irish Survey, are fully persuaded that certain coral-like forms from the crystalline limestone of Iuishowen are really coralline remains. One specimen should be referred to *Favosites fibrosa*, and others seem to be allied either to *Favosites* or *Columnaria*.

NEUMAYR (75) gives reason for referring *Calostylis* to the *Rugosa*. LINDSTROM (60) refers it to the *Perforata*.

SCHLÜTER (81) gives a very full account of the Corals of the Middle Devonian of the Rhine.

NICHOLSON (76) maintains that the genera *Syringolites* and *Rene* are separated by important morphological characters, and are not identical as Schlüter maintains.

CORAL REEF PROBLEMS.

The most important contribution to our knowledge of the structure and mode of origin of Coral reefs is by SLUITER (86). He points out that Dana's statement that the Coral reefs in the Java Sea are considerable is an exaggeration. In the west part of the Bay of Batavia there are thirty different coral islands and reefs in every possible degree of growth. A boring made on the Island of "Onrust" shows that it consists of ten metres of coral debris and clay resting on nine metres of Corals, mollusc shell and clay on a foundation of brown clay. Similar results of boring at Brantweinsbaai, near Padang, on the coast of Sumatra, shows that the Coral reefs do not rest directly on the Andesite rocks of which the mountains are composed, but on sandy or clay bottom. The paper concludes with a very interesting section on the first beginnings of a new Coral reef on the north-east coast of Krakatau, a celebrated volcano of the Sunda Straits.

AGASSIZ (2) describes a number of well borings made in the neighbourhood of Honolulu, and gives a description of the elevated reefs and living reefs of the Hawaiian island, with a summary of the recent literature of the Coral reef problems.

MOORE & BASSET SMITH (71) made the important discovery that Corals are growing freely on the Tizard and Macclesfield Banks, at a depth of 44 fathoms. 18 genera (88), or one-third of the Corals collected, were found in depths between 20 and 44 fathoms.

HEILPRIN (45) describes some observations he made on the Coral reefs of the Bermudas, during a vacation-journey in 1888. He devotes chapter (iv) to a discussion of the Coral reef problem, pointing out the difficulties in the way of accepting any theoretical views except those of Darwin. In an Appendix, there is a review of the recent literature of the subject.

In the third edition of Darwin's book (20) there is a review of the recent literature of the subject by BONNEY, who sums up in favour of the theory of subsidence.

In MURRAY'S lecture (73, 1st) there will be found a very concise résumé of his view on the Coral reef problems.

In the columns of *Nature* a lively controversy has been going on. Captain MOORE (70) points out that there is nothing to be noticed in the Fiji Islands that disproves the subsidence theory, and asks how on the other theory the reefs that closely follow the contour of the islands at the cleanly cut ship channels can be accounted for. To this MURRAY (73, 2nd) replies, and says that the more observations accumulate the more

does it seem probable that there never was a barrier reef or atoll formed after the manner required by Darwin's theory.

WILSON-BARKER (4) calls attention to the remarkable extension seawards of Coral reefs in certain places, and suggests that they are in the direction of the most copious food supply.

GUPPY (40, 1°) points out how ignorant we are at present of the actual processes that are taking place on Coral reefs, &c., and urges that the cases of the Cocos Islands, the 90 fathom reef of Rodriguez (*emend.*), the reef limestone of Cuba, and the Sandwich Islands, do not afford evidence in favour of Darwin's views. He also maintains (40, 3°) that nearly all the evidence ranged by Prof. Bonney on the side of Darwin, should be placed at least in a neutral position. It nearly all hinges on inferences that have not been established, or else on assumptions that cannot be proved. He also (40, 4°) replies to Capt. Moore's observations.

BONNEY (9) refers to an error in Guppy's first letter, and thinks that the *onus probandi* that a reef may commence at any depth which the exigencies of a particular case require, rests on Mr. Guppy.

GARDNER (38) considers it doubtful whether coral atolls can increase outwards on the talus of their own debris, in face of the solution of dead Coral that must take place.

Bearing on the Coral reef problem are HADDON's (42) remarks on the Coral beaches of Torres Straits.

HERBICK (46) gives an interesting popular account of the fauna of a Coral reef.

ALCYONARIA.

Very little advance has been made in our knowledge of the anatomy and development of the *Alcyonaria* during the year.

WRIGHT & STUDER's (95) account of the *Alcyonaria* of the 'Challenger' collection, supplemented by STUDER (87), is an important treatise on the classification and geographical and bathymetrical distribution of the group.

MARSHALL & FOWLER (63) describe the Pennatulids of the Mergui Archipelago, and BELL (7) gives a description of some new or rare Plexaurids.

VON KOCH (54) describes two stages in the development of *Pteroides spinulosus*.

2. PHYSIOLOGY.

FEWKES (30) observes that certain *Siphonophora* discolour the water, for defensive purposes, by the emission of pigment from certain chromatic cells on the bracts that are probably homologous with nematocysts. At present this mode of defence has only been observed in *Agalma clausi* and *Forskalia*, but similar discharges of colour occur in other *Siphonophora*.

GRABER (39) describes the results of some experiments he made on the

sensibility of marine animals to certain smelling substances. The Cœlenterates he experimented on were *Obelia geniculata*, *Carmarina hastata*, *Agalma sarsii*, *Veella spirans*, and *Beroë ovata*.

ISCHIKAWA (51) in attempting to repeat Trembley's experiments found that when a *Hydra* is artificially introverted, it returns by itself to its natural condition, and when this is prevented it dies. Trembley's view that the ectoderm and endoderm are physiologically interchangeable, is not based on experimental facts. The intermediate cells are not able to regenerate all the lost parts of a *Hydra's* body. They are young ectoderm cells, and, being such, can only produce ectoderm cells. When a *Hydra* catches a *Daphnia*, or other prey, that is too large to pass through the mouth, an evagination of endoderm takes place to digest it. Two *Hydras* can be completely fused together by fixing them together with bristles.

MACMUNN (62) examined the colouring-matters of the following Cœlenterates: *Chrysaora hyasocella*, *Cyanea*, *Corynactis viridis* and *Tubularia indivisa*. In *Corynactis* a green respiratory pigment is present, closely related to Actinohæmatin. It is not associated with yellow cells. The colouring-matter of *Tubularia* is a lipochrome, allied to rhodophan or xanthophan.

WILSON (94) gives the times of breeding of several Cœlenterates in the Bahamas. A purple *Pterogorgia* was with eggs until the end of December. None of the Corals examined were with eggs from July to January. A number of *Actinia* were with eggs during the warm season.

BEDOT (6) suggests a sulphate of copper solution for the killing of *Siphonophora*.

REVIEWS AND CRITICAL NOTICES.

BONNEY (20), AGASSIZ (2), and HEILPRIN (45) review the recent literature on the Coral reef problems.

CLAUS (16) criticises Hæckel's views on the morphology and classification of the *Siphonophora*.

VON LENDENFELD notices (56) Krukenberg's "Die nervösen Leitungsbahnen in dem Polypar der Alcyoniden"; Ortmann's "Systematik und Verbreitung der Steinkorallen"; (57) Allmann's *Hydroïda* of the 'Challenger'; Wilson "On the structure of *Cunoclantha*"; Brooks "On the life-history of *Epenthesis*"; Fewkes' "Medusæ from New England"; Krukenberg's "Der Wasseraustritt aus der Gallertscheide der Medusen"; (58) Vanhöffen's Untersuchungen über semaeostome und rhizostome Medusen; and (59) the 3rd edition of Darwin's Coral reefs.

MORGAN (72) reviews Wilson's paper on "The development of *Manicina*."

HARTLAUB (44) considers the positions of *Eleutheria dichotoma* of Quatrefages and Claparède.

FAUNISTIC.

1. GENERAL.

BROOK (13) describes the geographical and bathymetrical distribution of *Antipatharia*.

WRIGHT & STUDER (95, 87) of *Alcyonaria*, other than Pennatulids.

HAECKEL (43) of Hydroids parasitic on deep-sea *Keratosa*.

2. EUROPEAN WATERS.

BOURNE (10) gives a list of *Cœlenterata* found in the neighbourhood of Plymouth Sound.

HADDON (41) reviews the known species of British Sea-Anemones.

BÉTENCOURT (8) gives a list of Hydroids found in the Straits of Dover.

FISCHER (35) gives a list of the Pennatulids, and (37) the *Actinidæ*, of the French coasts.

DALLA TORRE (89) describes the *Cœlenterata* found in Heligoland.

SEGERSTEDT (83) describes the Hydroid fauna of the west coast of Sweden.

VON KOCH (55), the *Antipatharia* of the Bay of Naples.

KIRKPATRICK (52), the deep-sea *Hydrosœa* of the Irish Deep-Sea Survey.

3. AMERICAN WATERS.

McMURRICH gives a list of the *Actinidæ* found in the Bermudas (66, 45), and Bahamas (65).

FEWKES (31, 32) describes the various *Cœlenterates* he found on the coast of California, and (33) notices, for the first time, the occurrence of a *Physalia* in the Bay of Fundy.

PREFFER (79) describes the *Cœlenterata* of South Georgia.

4. INDIAN OCEAN.

ORTMANN (77) gives a list of Stony Coral from South Ceylon, and compares the fauna of the reefs with that of Africa and Polynesian reefs.

MARSHALL & FOWLER (63) give a list of the Pennatulids found in the Mergui Archipelago.

5. AFRICAN WATERS.

CHUN (15) gives a list of free-swimming *Cœlenterates* he observed in the Canary Islands.

6. CHINA SEAS.

MOORE & BANSET-SMITH (71) describe the bathymetric conditions of the corals on the Tizard and Macclesfield banks.

NEW GENERA AND SPECIES.

HYDROZOA.

HYDROIDA.

GYMNOBLASTEÆ.

Syncoryne occidentalis; FEWKES, (31) p. 3.

Corymorpha antarctica; PFEFFER, (79) p. 53.

Perigonimus formosa; FEWKES, (31) p. 6.

Amalthæa vardöensis; LOMAN (61).

CALYPTOBLASTEÆ.

Halisiphonia spongicola, HAECKEL, (43) p. 77, symbiotic with *noma* and *Psamphyllum*. *Stylactella spongicola*, *id. t. c.* p. 80, syn with many deep-sea *Keratosa*. *S. abyssicola*, *id. t. c.* p. 81, syn with *Stannomide* and *Spongelidæ*.

Campanularia occidentalis; FEWKES, (31) p. 4.

Atractyloides, n. g., *id. t. c.* Stems solitary, erect, brownish, at to a creeping hydrorhiza. Each hydranth projects from a cup-hydrotheca. Hydranth with a single circle of tentacles. Hydrotheca annulated. The sporosacs arise from the base of attachment of solitary erect stems. *Atractyloides formosa*, p. 5.

Grammaria intermedia; PFEFFER, (79) p. 53.

Hypanthea georgiana; *id. t. c.* p. 54.

Sertularia interrupta; *id. t. c.* p. 55.

Steenstrupia occidentalis; FEWKES, (31) p. 11.

Eleutheria clapedii, n. sp., = *E. dichotoma* of Claparède; HARRIS (44) p. 671.

MONOPSEÆ.

Willia occidentalis; FEWKES, (31) p. 13.

Microcampa, n. g. Differs from other *Medusæ* in the presence of radial tubes and a simple club-shaped tentacle. *Microcampa conica*, *id. t. c.*

SIPHONOPHORA

Velella meridionalis; FEWKES, (31) p. 16.

Athorybia californica; *id. t. c.* p. 20, and *id.* (28).

Sphæronectes gigantea = *Diplophysa inermis*; *id.* (31) p. 22

ACRASPEDA.

STAUROMEDUSÆ.

Halichystus antarctica; PFEFFER, (79) p. 52.

DISCOMEDUSÆ.

SEMOSTOMÆ.

- Pelugia neglecta*; VANHÖFFEN, (90) p. 9. *P. crassa*; *id.* t. c. p. 10.
P. minuta; *id.* t. c. p. 12.
Chrysaora chinensis; *id.* t. c. p. 16.
Desmonema chierchiana; *id.* t. c. p. 18.
Aurelia dubia; *id.* t. c. p. 20.

RHIZOSTOMÆ.

- Cassiopeia picta*; VANHÖFFEN, (90) p. 26.
Rhizostoma hispidum; *id.* t. c. p. 32.
Mastigias orsini; *id.* t. c. p. 34.
Desmostoma, n. g. This genus is allied to *Mastigias* by the presence of eight triangular oral arms with terminal knobs, from which and from the oral funnel there hangs a bundle of long strong lash filaments. *Desmostoma gracile*; *id.* t. c. p. 35.
Stomolophus chunii; *id.* t. c. p. 31.
Loborhiza, n. g. This genus is allied to Hæckel's genus *Lychnorhiza*. It possesses strong broad trilobate oral arms on which all filaments, lashes, and other peculiar appendages are wanting. The canal system also resembles that of this genus in the presence of broad anastomoses. *Loborhiza ornatella*; *id.* t. c. p. 28.

ANTHOZOA.

ZOANTHARIA.

ACTINIARIA.

HEXACTINIÆ.

- Bunodes californica*; FEWKES, (31) p. 28. *B. duregnei*; FISCHER, (37) p. 301. *B. tenuatus*; McMURRICH, (65) p. 23.
Aulactinia stelloides; *id.* t. c. p. 28.
Bunodella, n. g., PFEFFER (79). This new genus belongs to the family *Bunodidae*. The special character of the genus is that the spheridea are arranged in pronounced horizontal rows. *Bunodella georgiana*, p. 51.
Anemonia stimpsonii; FEWKES, (31) p. 31.
Oulactis fasciculata, McMURRICH (66, 45).
Diplactis, n. g. *Phyllactidæ* in which the fronds are represented by a single cycle of short digitiform tentacles, and in which all the mesenteries, except those of the first cycle, are gonophoric. *Diplactis bermudensis*; *id.* (66, 45). *D. delicatula* = *Hormathia delicatula* (Hert.).
Chitonactis marioni; HADDON, (41) p. 313.
Paraphellia, n. g. *Chondractininae* with thin mesogloea; circular muscle

relatively small, no coronal tubercles; scapus smooth or slightly corrugated; cuticle not developed; body encrusted with sand; base is often very widely extended. *Paraphellia expansa*; *id. l. c.* p. 321.

Cereactis bahamensis, McMURRICH, established in preliminary paper was afterwards declared by the author to be synonymous with *Candyle passiflora*.

New sub-tribe *Dendromelinæ*, including *Lebrunia* and probably *Opdiscus*; *id.* (67).

Peachia antarctica; PFEFFER, (79) p. 51.

EDWARDSIÆ.

Edwardsia tecta; HADDON, (43) p. 329. *E. luciphaga*; FISCHER, ([*vide* Zool. Rec. 1888]). Correction: *Diphthera* = *Edwardsia*; SLUT (85).

ZOANTHIDÆ.

Gemmaria isolata; McMURRICH, (65) p. 65.

ANTIPATHARIA.

BROOK (13) gives the following new genera and species, and von K (55) the two new species of *Antipathes*.

Family *Savagliidæ* = *Gerardiæ* (Verrill).

Family *Antipathidæ*. *Cirrhipathes propinqua*, p. 82, *C.* (?) *paucispina*, p. 86, *C.* (?) *flagellum*, p. 87, *C.* (?) *diversa*, p. 87.

Stichopathes, n. g. *Indivisa*, the polyps forming a single longitudinal row on one aspect of the stem. *Stichopathes pourtalesi*, p. 1. *S. gracilis* = *Antipathes* (*Cirrhipathes*) *gracilis* (Gray), p. 90; *S. echinula*, p. 92; *S.* (?) *desbonni* = *Cirrhipathes desbonni* (D. & M.); *S.* (?) *occidentalis* = *Cirrhipathes occidentalis* (Gray), p. 92; *S.* (?) *filiformis* = *C. filiformis* (Gray), p. 93; *S. lutkeni* = *C. filiformis* (Lütken).

Antipathes (?) *lentipinna*, p. 103; *A.* (?) *mediterranea*, p. 104; *A. gracilis*, von KOCH, (55) p. 196; *A. aenea*, *id. l. c.* p. 202.

Antipathella, n. g. *Ramosæ*. Polyps with ten mesenteries in the oral cone, six below. Polyps small, oval; tentacles disposed in two rows of three each; corallum extending more or less in one plane, with or without confluence of branches; spines usually short and somewhat triangular. *Antipathella subpinnata* = *Antipathes subpinnata* (E. & S.), p. 10; *A. strigosa*, p. 109; *A.* (?) *boscii* = *Antipathes boscii* (Lamx.), p. 110; *A.* (?) *intermedia*, p. 110; *A.* (?) *tristis* = *Rhipidipathes tristis* (Duch.), p. 111; *A.* (?) *atlantica* = *Antipathes atlantica* (Gray), p. 112; *A.* (?) *gracilis* = *Antipathes gracilis* (Gray), p. 113; *A.* (?) *paniculata* = *Aracnopathes paniculata* (Duch. & Mich.), p. 114; *A. minor*, p. 114; *A.* (?) *speciosa*, p. 116; *A. reticulata* (Esp.), p. 117; *A. assimilis*, p. 118; *A. coarctata*, p. 119.

Aphanipathes, n. g., p. 121. *Ramosæ*. Polyps with ten mesenteries in the oral cone, ten below. Polyps obscure, oral frequently hidden by the elongate spines; tentacles very short; corallum pinnate, paniculate, c

flabellate, with or without confluence of parts; spines elongate and slender. *Aphanipathes sarothamnicides*, p. 123; *A. (?) salix* = *Antipathes salix* (Pourt), p. 124; *A. (?) fruticosa* = *Antipathes fruticosa* (Gray), p. 124; *A. (?) verticillata*, p. 125; *A. (?) alata*, p. 126; *A. (?) wollastoni* = *Antipathes subpinnata* (Gray); *A. barbadensis*, p. 128; *A. (?) pedata* = *Antipathes pedata*, p. 128; *A. (?) pennacea* = *Antipathes pennacea* (Pall), p. 129; *A. (?) eupteridea* = *Antipathes eupteridea* (Lam.), p. 130; *A. (?) humilis* = *Antipathes humilis*, p. 131; *A. (?) thyroides* = *Antipathes thyroides* (Pourt), p. 131; *A. (?) filix* = *Antipathes filix* (Pourt), p. 132; *A. (?) abietina* = *Antipathes abietina* (Pourt), p. 133; *A. can-cellata*, p. 133.

Tylopathes, n. g., p. 135. *Ramosæ*. Polyps with ten mesenteries in the oral cone. Polyps forming oval cushion-like prominence on the cœnenchyma; corallum much branched and flabellate, with more or less fusion of parts; spines short. *Tylopathes crispa*, p. 135; *T. flabellum* = *Antipathes flabellum*, p. 137; *T. (?) dubia*, p. 138, *T. (?) hypnoides*, p. 138, *T. (?) elegans*, p. 139.

Pteropathes, n. g., p. 140. *Ramosæ*. Polyps with ten mesenteries in the oral canal. Polyps small, crowded so as to have a somewhat rectangular outline; sagittal tentacles inserted into the base of the polyp; corallum flabellate; spines very long and stout. *Pteropathes fragilis*, p. 140.

Parantipathes, n. g., p. 141. *Ramosæ*. Polyps with ten mesenteries in the oral cone. Polyps much elongated in the direction of the horny axis; tentacles elongate, arranged in couples, separated by a considerable interval; spines short and distant. *Parantipathes larix* = *Antipathes larix* (Esp.), p. 142; *P. (?) tetrasticha* = *Antipathes tetrasticha* (Pourt), p. 143; *P. (?) fernandesi* = *Antipathes fernandezii* (Pourt), p. 144; *P. (?) hirta* = *Antipathes hirta* (Gray), p. 144; *P. (?) columnaris* = *Arachnopathes columnaris* (Duch.), p. 145.

BROOKS' new subfamily *Schizopathinae*, characterized by the presence of dimorphism, contains the following genera:—

- A. Corallum consisting of a simple stem, bearing elongate, simple, and usually lateral branches; spines short and conical, extending at right angles to the axis.
 - a. Base free, flattened and tapering, hooked up at the extremity; zooids crowded; stomodæum elongated in the sagittal axis. } *Schizopathes*, n. g.
 - a. Base dilated and adherent; zooids always isolated. } *Bathypathes*, n. g.
- B. Corallum much branched; spines much longer and hooked upwards.
 - a. Corallum consisting of an erect stem, with strong branches at right angles, bearing six rows of pinnules in two opposite half spirals; zooids somewhat isolated; mesogloia thin; stomodæum elongated in the transverse axis. } *Taxipathes*, n. g.

B. alternata, p. 153, *B. lyra*, p. 154, *B. tenuis*, p. 155, p. 156; *Cladopathes plumosa*, p. 157.

DENDROBRACHIDÆ, n. fam.

Dendrobrachia, n. g. Distinguished by the fact that ultimately consists of a rounded spinose axis; but is tubular, as in the *Antipathidæ*. *Dendrobrachia fallax*,

INCERTÆ SEDIS.

Arachnopathes aculeata, p. 165, [*Antipathes*] *japon*
pathes] *bifaria*, p. 170, [*Antipathes*] *p.mila*, p. 172, [*Ant*
p. 172.

MADREPORARIA.

ORTMANN (77) adds the following new species —

THAMNASTRÆACEA.

Siderastræa sphæroidalis, p. 496.

MADREPORACEA.

Turbinaria quincunqualis, p. 497.

Madrepora multiformis, p. 504, *M. ceylonica*, p. 50
p. 507, *M. coalescens*, p. 509, *M. remota*, p. 510.

RUGOSA.

SCHLÖTER (81) adds the following new genus and new species :—

Kunthia incurva, p. 4.

Zaphrentis erecta, p. 24. BARROIS (5) adds: *Zaphrentis ligeriensis*, p. 52, *Z. armoricana*, p. 53.

Hallia striata, p. 29.

Campophyllum spongiosum, p. 46.

Fasciphyllum varium, p. 48.

Spongophyllum büchelense, p. 63, *S. tabulosum*, p. 66.

New genus *Mesophyllum*, containing many species previously attributed to *Actinocystis*, *Plasmophyllum*, &c., p. 67.

Cystiphyllum macrocystis, p. 88.

BARROIS (5) adds: *Cyathophyllum caillaudi*, p. 47, *C. pictonense*, p. 49.

Acervularia namnetensis, p. 40, *A. venetensis*, p. 42.

Briantia, n. g. Polypide simple, septa well developed, alternately arranged, the largest reaching to the centre of the calyx, where they are bent. An interior and exterior concentric area can be observed. This genus is closely allied to *Cyathophyllum*; but has affinities with *Acervularia* and *Spongophyllum*. *Briantia repleta*, p. 45.

WEBSTER (92) adds: *Puchiphyllum crassirostatum*, p. 623, *P. ordinatum*, p. 624, and *P. crassum*, p. 624.

FOSSIL CORALS OF UNCERTAIN POSITION.

SCHLÖTER (81) describes the following new species :—

Pleurodictyum granuliferum, p. 103.

Alveolites fornicata, p. 125.

Vermipora (?) *striata*, p. 130, *V. gracilis*, p. 130.

Monotrypa clavosa, p. 147.

Fistulipora bicornis, p. 155, *F. cyclostoma*, p. 161.

Aulocystis entalophoroides, p. 165.

BARROIS (5) adds: *Striatopora minima*, p. 36; *Cænites sparsus*, p. 37.

Spirocyathus, n. g. Infundibuliform or subcylindrical forms, with an axial subcylindrical tube or cavity bounded by thick walls. These are built up of relatively thick, solid, inosculating plates or laminae, partially connected by delicate fibres, which form a reticulate tissue with irregular lacunae, or canals. The lamina forming the outer surface, and that next the axial tube, are much stouter than those of the central portions of the wall. The outer lamina is apparently perforated by minute apertures, and larger canals connect the interspaces of the wall tissue with the central cavity. HINDE, (50) p. 136. *Spirocyathus* = *Archæocyathus atlanticus*.

Archæocyathus minganensis proves to be a siliceous Sponge; *id. t. c.*

ALCYONARIA.

WRIGHT & STUDER (95) give the following new genera and species :—

Order STOLONIFERA.

Clavularia tubaria, p. 256, *C. elongata*, p. 257. *C. cylindrica*, p. 257. *Symphodium verrilli*, p. 271, *S. armatum*, p. 272, *S. glomeratum*, p. 273.

Order ALCYONIDA.

Telesto rigida, p. 261, *T. arborea*, p. 262; *Alcyonium antarcticum*, p. 262, *A. sollasi*, p. 240, *A. haddoni*, p. 240; *Anthomastus canariensis*, p. 242, *stenastrupi*, p. 243; *Sarcophytum tongatabuensis*, p. 245, *S. atlanticum*, p. 245, *S. philippinensis*, p. 246, *S. ambiguum*, p. 247; *Lobophytum nassella*, p. 251.

PFFEFFER (79) proposes the new genus *Metalcyonium*, related to genera *Anthomastus* and *Sarcophytum*, but separated from them by absence of siphonozooids. This genus includes two species: *Metalcyonium clavatum*, p. 49, *M. capitatum*, p. 50.

Eunephthya fusca, p. 190; *Spongodes digitata*, p. 193, *S. spicata*, p. 193, *S. nephthyaformis*, p. 195, *S. carnea*, p. 196, *S. macrospina*, p. 199, *S. corymbosa*, p. 201, *S. umbellata*, p. 203, *S. dendrophyta*, p. 204, *S. angulata*, p. 205, *S. bicolor*, p. 207, *S. collaris*, p. 208, *S. heterocyathus*, p. 210, *S. coronata*, p. 212, *S. pustulosa*, p. 213, *S. monticulosa*, p. 215, *S. laza*, p. 215, *S. rhodostatica*, p. 218, *S. cervicornis*, p. 220, *S. semperi*, p. 221.

Paranephthya, n. g. Upright, ramified colonies, on whose terminal twigs the polyps are placed in thick clusters. The polyps are retractile. The canals of the colony are narrow, and divided from one another by relatively thick partition walls, which contain scattered spicules. The outer covering is smooth. As regards the form and build of the colony, it stands nearest to *Dura* (Dan. & Kor.), and certain forms of *Nephthya*. *Paranephthya capitulifera*, p. 227.

Scleronephthya, n. g. The stem is upright, branched; the surface of the branches and twigs bear scattered polyps, which collect together in groups on the terminal twigs and completely cover them. The canal system consists in the main stem of numerous narrow canals, divided from one another by thick partition walls filled with spicules. The spicules are large, sharp-pointed needles, which form a thick coat of mail around the polyps, and are continued and arranged, *en chevron*, into the bases of the tentacles, where they latter form a kind of operculum over the oral region. Beneath the bases of the tentacles the spicules form a distinct collaret. This genus comes close to *Nephthya* and *Siphonogorgia*. *Scleronephthya petulosa*, p. 229.

Chironephthya, n. g. Colony rigid, upright, ramified. The ascending barren stem gives off, after a longer or shorter course, stiff, finger-like branches. The polyps arise at wide intervals along the whole extent of the branches. At the apex they are rather more crowded. They consist of a calyx which is pressed against the branch, a retractile oesophageal portion, and a tentacular portion which is provided at the base with a collar of spicules. The bases of the tentacles, armed with spicules, form a conical quasi operculum. This genus comes nearest to *Siphonogorgia*. *Chironephthya dipsacea*, p. 231, *C. scoparia*, p. 232, *C. crassa*, p. 234.

Siphonogorgia köllikeri, p. 236. STUDER (87) adds : *S. pendula*, p. 5, *S. pustulosa*, p. 7, *S. pallida*, p. 8.

Order GORGONIDA.

Strophogorgia petersi, p. 2, *S. fragilis*, p. 4 ; *Dasygorgia flexilis*, p. 10, *D. cupressa*, p. 11, *D. squarrosa*, p. 14, *D. melanotrichos*, p. 15, *D. expansa*, p. 16, *D. geniculata*, p. 17, *D. acanthella*, p. 18, *D. axillaris*, p. 20, *D. japonica*, p. 21 ; *Ceratoisis philippinensis*, p. 27, *C. paucispinosa*, p. 28, *C. nuda*, p. 28, *C. palmae*, p. 29 ; *Acanella chiliensis*, p. 31, *A. rigida*, p. 31.

Primnoisis, n. g. Colony ramified in several planes, polyps large, arising at wide intervals. Spicules of the calyx large. This genus stands very near to *Mopsea*, to which *Primnoisis ambigua*, in the condition of the calyx and spicules, directly leads. *Primnoisis antarctica* = *Isis antarctica* (Studer). *P. sparsa*, p. 36, *P. rigida*, p. 37, *P. ambigua*, p. 39.

Acanthoisis, n. g. Colony ramified in one plane, polyps insignificant, cylindrical, with truncated mouth-opening. Spicules of the calyx minute, needle-like. Toothed ribs on the calcareous joints of the axis. This genus also stands very close to *Mopsea* ; the spicules closely resemble those of *M. dichotoma*, but, apart from the different habit of the colony, the polyps show a totally different form, and most of the branches arise from the middle of the calcareous joints. *Acanthoisis flabellum*, p. 45.

Calypterinus, n. g. Axis simple, consisting of a horny axis, largely filled with calcareous particles. Polyps arranged in regular verticils on the axis, of from five to seven each ; at each verticil a portion of the axis is free from polyps, but the large wing-like calcareous spicules of the lateral polyps overlap and form a circular opening, which runs in a direct line all along that portion of the axis that is free from polyps. The polyps are thus, in a measure, bilaterally arranged. *Calypterinus allmani*, p. 53.

Stachyodes, n. g. Axis sparingly and dichotomously branched, consisting of a dense horny matrix, with calcareous particles intermixed in the older portions, highly iridescent. Polyps in closely arranged verticils, about five in each verticil ; tentacles retractile ; when retracted the opercular scales touching the basal scales of the lower row of polyps. Polyps with oral region opening downwards. Spicules of the bodies of the polyps in three series of two each, the spicules of each series either touching each other or overlapping and symmetrical. *Stachyodes regularis*, p. 55.

Stenella johnsoni, p. 57, *S. gigantea*, p. 57, *S. dæderlini*, p. 58, *S. spinosa*, p. 58, *S. acanthina*, p. 59 ; *Thouarella moseleyi*, p. 61, *T. köllikeri*, p. 64, *T. affinis*, p. 66, *T. variabilis*, p. 68.

Amphilaphis, n. g. This genus exhibits in the form of the calyces and scales a relationship to *Thouarella*, from which, however, it is distinguished by the mode of ramification. This latter exhibits already the condition of *Plumarella*, in which, however, the calyces come off only from two sides of the twigs. The new genus may therefore be considered as a connecting link between *Thouarella* and *Plumarella*. *Amphilaphis regularis*, p. 71.

Plumarella delicatissima, p. 74; *Caligorgia sertosa*, p. 77; *Primnoella murrayi*, p. 84, *P. grandisquamis*, p. 86. *P. biserialis*, p. 87.

Primnoidinae, n. subfam. Colony branched, with oppositely placed polyps. The spicules are flat, thin scales, deposited uniformly in the cœnenchyma and in the polyp calyces, and covering each other like tiles on a roof. The opercular plates are not distinctly differentiated, and therefore the oral region is only incompletely protected. The axis is horny, calcareous.

Primnoides, n. g. An upright colony ramified in one plane, the branches arise oppositely and bear two rows of oppositely placed polyps. The spicules on the stem and calyces are flat, thin scales, which cover each other like roof-tiles, and are uniformly spread over the stem and calyces. The operculum is rudimentary and not capable of covering the mouth of the retracted polyp. Axis horny, calcareous. The polyps arise in an intercalary manner. *Primnoella sertularoides*, p. 90.

Acanthogorgia longiflora, p. 94, *A. ridleyi*, p. 95, *A. laza*, p. 96, *A. ramossissima*, p. 97; *Paramuricea æquatorialis*, p. 100, *P. laza*, p. 101, *P. ramosa*, p. 102.

Authomuricea, n. g. Colony with a branched stem and a horny axis. The polyps have cylindrically shaped calyces, which stand out perpendicularly to the axis. These are supported by eight series of spiny spindle-shaped spicules, placed *en chevron*, which are often more thickly packed at the apices. The basal portions of the tentacles constitute an eight-rayed conically projecting operculum; each of the eight rays is composed of many converging spiny spicules, which lie one above the other, and are placed *en chevron*. *Authomuricea argentea*, p. 104.

Muriceides, n. g. In this genus the colony is erect, slightly branched, with a thin cœnenchyma on which the large upright polyps arise at considerable intervals; the basal portion of their tentacular coronet is armed with strong spicules, and when in repose it is folded from about midway over the oral disc, its base forming a somewhat lofty operculum. There is also a ring-shaped collaret of spicules. The calycine spicules are irregularly placed, and here, as in the cœnenchyma, their terminal points project often as short rough needles. This genus comes between *Paramuricea* and *Clematissa*. *Muriceides fragilis*, p. 105.

Clematissa, n. g. Like *Muriceides* in habit, but resembling *Paramuricea* in its club-like thickened terminal branches, whose apices end in polyps. The spicules of the polyps are spiny, club-like, thickened at one end, not presenting the regular arrangement of those of *Paramuricea*. The basal portion of each tentacle, which is not retracted, contains two rows of converging, unilaterally thickened spicules. *Clematissa verrilli*, p. 107, *C. robusta*, p. 108, *C. obtusa*, p. 108.

Placogorgia, n. g. This genus, in the habit of the polyps, and especially in the form of the opercular covering, shows a near affinity to *Villogorgia*, while the form and arrangement of the "Stachelplatten," as well as their great development, show a relationship to *Acis*. *Placogorgia atlantica*, p. 114.

Acamptogorgia, n. g. This genus stands in near relationship to *Echinogorgia*, but at once shows a difference in the more fully developed polyps

and their opercular coverings, and in the form of the spicules. *Acamptogorgia arbuscula*, p. 116, *A. alternans*, p. 117.

Acis pustulata, p. 122; *Muricella complanata*, p. 125, *M. gracilis*, p. 129, *M. crassa*, p. 131.

Elasmogorgia, n. g. This genus has been constituted for a small Muriceid with a flexible horny axis, which is covered by a thin, but not transparent, cœnenchyma. The polyps rise at large intervals, and at right angles to the stem. They are short, and bluntly conical. The tentacles are quite retractile, and when in a state of repose the margin of the calyx is quite infolded over them. *Elasmogorgia filiformis*, p. 133.

Muricea bicolor, p. 134.

Plexaura valenciennesi, p. 137.

Plexauroides, n. g. *Plexauroides prælonga* = *Plexaura prælonga* (Ridley), p. 138.

Plexaurella philippinensis, p. 140.

Pseudoplexaura, n. g. *Pseudoplexaura crassa* = *Gorgonia crassa* (E. & S.), p. 142.

Euplexaura pinnata, p. 144, *E. paracirlados*, p. 144.

STUDER (87) adds: *Eunicea palmata*, p. 14.

BELL (7): *Plexaurella affinis*, p. 48.

STUDER (87) adds: *Echinogorgia modesta*, p. 9; *Bebryce philippi*, p. 10; *Anthogorgia japonica*, p. 12.

Platycaulos, n. g. Colony branched, the branches in one plane anastomosing. The axis is horny, flattened, with a calcareous centre and calcareous particles scattered amid the horny layer; the nutrient canals surrounding the central axis almost as in *Plexaura*. Polyps prominent on the sides of the stem and branches; retractile within verrucæ. Cœnenchyma moderate, like shagreen. Spicules straight, and curved spiny spindles and stellate forms. *Platycaulos danielsseni*, p. 147.

Callistephanus, n. g. Axis horny, circular, with a calcareous central portion, and in the older portions calcareous particles interspersed. Polyps very prominent, the tentacles and bodies retractile within dome-shaped verrucæ, and arising for the most part alternately from the sides of the stem and branches. The cœnenchyma is thick and granular. The spicules of the cœnenchyma are spiny spindles, clubs, and half-sided warty clubs. *Callistephanus koreni*, p. 149.

Lophogorgia lutkeni, p. 150; *Leptogorgia torresia*, p. 152.

Scirpearella, n. g. A genus allied to Kœlliker's *Scirpearia*. The colony simple, or very feebly branched. Axis calcareous, brittle, smooth, or symmetrically grooved on the surface. Polyps arranged in spirals, or sometimes in rows on the stem; tentacles and upper portion of the polyps retractile within prominent verrucæ. Cœnenchyma moderately thick, with spiny spindles and double clubs forming a roughened outer layer. The following four species are from the Pacific Ocean:—*Scirpearella profunda*, p. 155, *S. gracilis*, p. 156, *S. moniliforme*, p. 156, *S. rubra*, p. 156.

Juncella racemosa, p. 159.

Gorgonella orientalis, p. 151. VON MARTENS (64) adds *Gorgonella reticosa*.

Suberia genthi, p. 163 ; *Suberogorgia köllikeri*, p. 167.

Keraïdes, n. g. Axis sclerogorgic, the nutrient canals are central core ; the coenenchyma moderate and friable, situated on either side of a much-branched stem and the space free of polyps forms a well marked groove running down of the stem and its branches. *Keraïdes koreni*, p. 169.

Melitodes rugosa, p. 174, *M. rubeola*, p. 175, *M. philippi*, *M. sinuata*, p. 177, *M. nodosa*, p. 178, *M. laevis*, p. 179, *M. e. fragilis*, p. 180.

Parisia australis, p. 183, *P. minor*, p. 184.

PENNATULIDA.

Virgularia prolifera ; MARSHALL & FOWLER, (63) p. 279.
Policella tenuis ; *id. t. c.* p. 285.

SPONGIÆ.

BY

OSWALD H. LATTEB, M.A.

I.—LIST OF PUBLICATIONS.

1. AUCHENTHALER, F. Ueber den Bau der Rinde von *Stelleta grubii*, O. S. Ann. Hofmuseum Wien, iv, i, pp. 1-6, pl. i.
2. BEECHER, C. E. *Brachiospongida*: A memoir on a group of Silurian Sponges; with six plates. Am. Geol. iii, 1889, p. 268.
Resumé from Mem. Peabody Museum, Yale Univ. II, i.
3. CARTER, H. J. Sketch of the History of known Fossil Sponges in Relation to those of the Present Day. Ann. N. H. iv, pp. 280-290.
4. — & HOPE, R. On a new British Species of *Microciona*, in which the ends of the Tricurvate are Spiniferous, &c. *Op. cit.* iii, 1889, pp. 99-106, pl. vi; also J. R. Micr. Soc. 1889, 3, p. 396.

The authors describe as a new species, *Microciona spinarcus*, which had previously been referred to *M. armata*, Bk.

5. DENDY, A. Report on a Second Collection of Sponges from the Gulf of Manaar. T. c. pp. 73-99, pls. iii-v; also J. R. Micr. Soc. 1889, 3, p. 396.

24 species are described, of which 14 are new to science and 2 are represented by new varieties. Of the new species, 1 belongs to the *Tetractinellida*, 11 and the 2 new varieties to the *Monazonida*, 1 (and a doubtful *Hircinia*) to the *Ceratosa*.

6. —. *Stelospongos flabelliformis*. J. R. Micr. Soc. 1889, 2, pp. 233 & 234. Abstract of Q. J. Micr. Sci. xxviii, pt. 4, pp. 513-529.
7. —. An alphabetical list of the Genera and Species of Sponges described by H. J. Carter, Esq., F.R.S., together with a number of his more important references to those of other authors, with an Introductory Notice. P. R. Soc. Vict. 1889 (n.s.) i, pp. 34-59.

The list contains references to the first descriptions of all the species described.

8. [DENDY, A.] Preliminary notes on the structure and development of a Horny Sponge (*Stelospongos flabelliformis*). *T. c.* pp. 62-72.
9. DUNIKOWSKI, E. H. O Gabkach Cenománskich z Warstury Fory towaj Podola Galicyjskiego. *Pam. Akad. umiej. wydz. przyr.* Krakau, xvi, pp. 70-87, pls. i-iii.

There are described and figured of *Craticularia*, 2 new species; *Ventriculites*, 3 new species; *Sestrocladia*, 1 new species; *Plocoscyphia*, 4 new species; *Toulminia*, 2 new species; *Callodictyon*, 1 new species. Chemical analyses of some of the species are given, pp. 75 & 76.

10. ECKSTEIN, K. Repetitorium der Zoologie. Leipzig: 8vo. *Spongiaria*, pp. 35 & 36.

11. FRÍČ, A. Studien im Gebiete der Böhmischen Kreideformation. Palæontologische Untersuchungen der einzelnen Schichten. iv. Die Teplitzer Schichten. *Porifera*. *Arch. naturw. Landesforsch. Böhmen*, vii, 2, pp. 58, 59, & 102-109, figs. 136-154.

In the first part the geographical distribution of the species, 29 in number, is given in a tabular form; in the second, short descriptions and figures.

12. GIROD, P. Les Spongilles, leur recherche, leur preparation, leur détermination. *Rev. Sci. Bourb.* ii, 1889, No. i, pp. 16-24, pl. i.
13. HAECKEL, E. Report on the Deep-Sea *Keratosa* collected by H.M.S. 'Challenger' during the years 1873-76. *Challenger Reports*, xxxii, Part lxxxii, pp. 1-92, pls. i-viii.

11 deep-sea genera, with 26 species, are described, all of which are new. The majority have a very abundant pseudo-skeleton, and live in symbiosis with certain Hydroids which are characterised by the enormous development of a reticular hydrorhiza which produces directly sessile gonophores, and by other features (pp. 75-77). A table of geographical and bathymetrical distribution is given. The general organisation is described, pp. 11-21. The classification employed is as follows:—

Fam. AMMOCONIDÆ, n. fam.

Genus. *Ammolynthus*, n. g., with 2 new species.

Genus. *Ammosolenia*, n. g., with 1 new species.

Genus. *Ammoconia*, n. g., with 2 new species.

Fam. PSAMMINIDÆ, Lendenfeld.

Genus. *Psammia*, n. g., with 3 new species.

Genus. *Holopsamma*, Carter, with 3 of Carter's species and 2 new species.

Genus. *Psammopemma*, Marshall, including 2 *Holopsamma* (Carter) species and 2 new species. *Psammopemma* (Poléjaeff) species, transferred to *Cerelasma* (*vide infra*).

Fam. SPONGELIDÆ, Lendenfeld.

Genus. *Cerelasma*, n. g., with Poléjaeff's *Psammopemma* and 2 new species.

Genus. *Psammophylum*, n. g., with 3 new species.

Fam. STANNOMIDÆ, n. fam.

Genus. *Stannophylum*, n. g., with 5 new species.Genus. *Stannarium*, n. g., with 2 new species.Genus. *Stannoma*, n. g., with 3 new species.

An appendix is given (pp. 75-81) of the Symbiotic *Hydroïda* living in the deep-sea *Keratosa*. A new *Halisiphonia* is described and figured, and a new genus, *Stylactella*, founded, with two new species.

The principles of classification are discussed (pp. 82-85), and the relation of *Keratosa* to other Sponges (pp. 85-90). The author does not accept the hypothetical origin of the *Keratosa* from *Silicosa*, and puts forward the following provisional classification of Sponges founded on the skeletal structure :—

Class I. *MALTHIOSPONGIÆ* (*Malthosa*).Order 1. MYXOSPONGIÆ (*Halisarcidæ*, *Chondrosidæ*).Order 2. PSAMMOSPONGIÆ (*Ammoconidæ*, *Psamminidæ*).Order 3. CERAOSPONGIÆ (*Spongelidæ*, *Stannomidæ*, *Darwinellidæ*, *Euspongidæ*, *Aplysinidæ*).Class II. *SILICISPONGIÆ* (*Silicosa*).Order 4. DEMOSPONGIÆ (*Monaxonidæ* and *Tetractinellidæ*).Order 5. HYALOSPONGIÆ (*Hexactinellidæ*).Class III. *CALCISPONGIÆ* (*Calcareosa*).Order 6. ASCOSPONGIÆ (*Asconidæ* and *Homocelæ*).Order 7. LEUCOSPONGIÆ (*Syconidæ*, *Leuconidæ*, *Teichonidæ*).Order 8. PHARASPONGIÆ (*Pharettonidæ*).

The Report concludes with a Synopsis of the main branches, &c., of the *Metazoa*.

14. HALL, T. S. On two new fossil Sponges from Sandhurst. P. R. Soc. Vict. 1889 (n.s.) i, pp. 60 & 61, pl. iv.

Both species are *Hexactinellida* belonging to the genus *Protospongia*. They were found in "rock of the Landeilo flag age."

15. HANITSCH, R. Second Report on the *Porifera* of the L.M.B.C. district. P. Liverp. Biol. Soc. iii, pp. 155-173, pls. v-vii; also J. R. Micr. Soc. 1889, 5, p. 649.

Reniera semitubulosa is first reported from British seas; and 1 new species described, for which a new family, *Seiriolidæ*, is founded.

16. HINDE, G. J. On a true Leuconid Calcisponge from the Middle Lias of Northamptonshire, and on detached Calcisponge Spicules in the Upper Chalk of Surrey. Ann. N. H. iv, 1889, pp. 352-357, pl. xvii.

A new species, *Leucandra walfordi*, is described and figured.

17. HOPE, R. On two new British Species of Sponges, with short notices of an Ovirigerous Specimen of *Hymeniacidon Dujardinii*, Bowk., and of a fossil Toxite. T. c. pp. 333-342, pl. xvi; also J. R. Micr. Soc. 1890, i, p. 50.

The new species described are *Microciona strepsitoxa* and *Trachytedania* (?) *echinata*, n. spp.

4 Spong.

SPONGE.

18. HOYLE, W. E. On the Deep-Water Fauna of the Clyde Sea-A Porifera. J. L. S. xx, No. 123, pp. 460 & 461.

19. KELLER, C. Die Spongienfauna des rothen Meeres. Z. wiss. z. xlviii, pp. 311-406, pls. xx-xxv, 2 woodcuts.

The author deals with the organisation of the *Ceratosa*, pp. 316-317 and their phylogeny, pp. 329-335; of the *Monactinellida*, pp. 362-372-374 respectively. There are described as new: 1 *Spongia Dysidea*, *Heteronema*, n. g., with 1 species, 3 *Hircinia*, 1 *Carteriopsis*, 1 *Halma*, 1 *Aplysilla*, 1 *Psammaphysilla*, 2 *Cacochalina*, 1 *Gellioid*, *Sclerochalina*, 3 *Phyllosiphonia*, 1 *Siphonochalina*, 1 *Antherochalina*, *Pachychalina*, 4 *Ceraochalina*, 1 *Dactyochalina*, 1 *Arenochalina*, 3 *Aethella*, 1 *Azinella*, 1 *Acanus*, and 1 *Latrunculia*.

20. KIRKPATRICK, H. Report of a Deep-Sea Trawling Cruise off S.W. Coast of Ireland, under the direction of Rev. W. Spots Green. Sponges, &c. Ann. N. H. iv, pp. 446.

Aphrocallistes bocagei, Wright, was only species taken.

21. LEIDY, J. The Boring-Sponge, *Cliona*. P. Ac. Philad. pt. i, 1 pp. 70-75.

22. LENDENFELD, R. v. Experimentale Untersuchung über die Physiologie der Spongien. Z. wiss. Zool. xlviii, pp. 406-740, xxvi-xl.

An exhaustive account of series of experiments on many different Sponges with carmine, morphia, strychnine, veratrine, cocaine, curare. The results are fully described, and also presented in a tabular form. The mode of nutrition is discussed, pp. 672-675; the collar-cells responsible for the absorption of food from the inhalent currents. account of the various movements of Sponges concludes the paper, pp. 675-680. [Vide Nature, xli, p. 570.]

23. —. Fortschritt unsrer Kenntniss der Spongien. Zool. Jahrb. ii, pp. 453-484.

An epitome of recent publications.

24. —. Notiz über den Bau der Geisselkammern der Spongien. Z. Anz. 1889, No. 311, pp. 361 & 362; also J. R. Micr. Soc. 1889, 5, 648 & 649.

25. —. Das System der Spongien. Biol. Centralbl. ix, 4, pp. 113.

A review of the systematic relations of the *Celenterata* and *Porifera*. The author includes both under one heading, "*Celenterata*," which subdivides into Phylum I, *Mesodermalia* (Sponges); Phylum II, *Ephyra* (*Polypomellus*, *Anthozoa*, *Ctenophora*, &c.).

Phylum. MESODERMALIA, Lendenfeld.

Class I. CALCAREA, Gray.

Order I. HOMOCELA, Poljjaeff (emend.).

Fam. I. ASCONIDE, Haeckel (emend.).

Fam. II. HOMODERMIDE, Lendenfeld.

Fam. III. LEUCOSIDE, Lendenfeld.

Order II. HETEROCELA, Poléjaeff (emend).

Fam. I. SYCONIDÆ, Haeckel (emend).

Subfam. i. *Syconina*, Lendenfeld.Subfam. ii. *Uteina*, Lendenfeld (emend).

Fam. II. SYLLEIRIDÆ, Lendenfeld.

Subfam. i. *Vosmarina*, Lendenfeld.Subfam. ii. *Poléjna*, Lendenfeld.

Fam. III. LEUCONIDÆ, Haeckel.

Fam. IV. TRICHONIDÆ, Carter.

Class II. SILICEA, Gray.

Subclass I. TRIAXONIA, Schulze (emend).

Order I. HEXACTINELLIDA, Schmidt.

Subord. 1. LYSSACINA, Zittel (emend).

Tribe I. HEXASTEROPHORA, Schulze.

Fam. I. EUPLECTELLIDÆ, Gray.

Subfam. i. *Euplectellina*, Schulze.Subfam. ii. *Holascina*, Schulze.Subfam. iii. *Tagerina*, Schulze.

Fam. II. ASCONEMATIDÆ, Schulze.

Subfam. i. *Asconematina*, Schulze.Subfam. ii. *Sympugellina*, Schulze.Subfam. iii. *Caulophacina*, Schulze.

Fam. III. ROSSELLIDÆ, Schulze.

Tribe II. AMPHIDISCOPHORA, Schulze.

Fam. I. HYALONEMATIDÆ, Schulze.

Subfam. i. *Hyalonematina*, Schulze.Subfam. ii. *Semperellina*, Schulze.

Subord. 2. DICTYONINA, Zittel.

Tribe I. UNCINATARIA, Schulze.

Subtribe I. CLAVULARIA, Schulze.

Fam. I. FARREIDÆ, Schulze.

Subtribe II. SCOPULARIA, Schulze.

Fam. I. EURETIDÆ, Schulze.

Fam. II. MELITIONIDÆ, Zittel.

Fam. III. COSCINOPORIDÆ, Zittel.

Tribe II. INERMIA, Schulze.

Fam. I. MÆANDROSPONGIDÆ, Zittel.

Order II. HEXACERATINA, n. ord., Lendenfeld.

Fam. I. DARWINELLIDÆ, Lendenfeld.

Fam. II. APLYSILLIDÆ, Lendenfeld.

Fam. III. HALISARCIDÆ, Vosmaer (emend).

Subclass II. TETRAXONIA, Schulze (emend).

Order I. CHONDROSPONGIÆ, Lendenfeld.

Subord. 1. LITHISTIDA, Schmidt.

Subord. 2. CHORISTIDA.

[Sollas' Classification of these two suborders adopted without change (Chall. Rep. xxv), excepting the insertion among *Choristida* of a new Tribe, *Megasclerophora*, Lendenfeld, with Fam. i, *Tethyopsillida*, Lendenfeld.]

duction, containing a brief historical summary and a detailed list of publications relating to Sponges, followed by a description of the methods of research. II. An analytical portion, devoted to the systematic description of all the known Horny Sponges. III. A synthetical part, in which the anatomy and physiology of Sponges, especially of Horny Sponges, are treated, and their phylogeny, systematic position, and classification discussed." The classification adopted is as follows :—

Order I. CORNACUSPONGIÆ.

Ordo artificialis. MONOCERATINA.

Fam. I. *AULENIDÆ*.

Genus. *Hyattella*, n. g., pp. 101–121, includes some forms of *Hippospongia* and *Hircinia*, and 10 new species.

Fam. II. *SPONGIDÆ*, Schulze, emend.

Subfam. I. *EUSPONGINÆ*, Lendenfeld.

Genus. *Chalinopsilla*, n. g., pp. 124–133, includes species of *Velinea*, *Chalina*, *Chalinopsis*, *Euspongia*, *Paraspongia*, *Dactylia*, *Tuba*, and *Psammelemma*, and 3 new species and 2 new varieties.

Genus. *Phyllospongia*, Ehlers, pp. 154–171.

1. Subgenus. *Antheroplax*, n. subg., p. 171, including Carter's *Geelongia*, some of *Carteriospongia* and *Phyllospongia* of Hyatt, Carter, and Ridley, together with 5 new species and 4 new varieties.

2. Subgenus. *Spongionella*, Bowerbank, including *Spongia papyracea*, Esper, species described by Bowerbank as *Spongionella*, by Hyatt as *Carteriospongia*, and by Ridley as *Phyllospongia*, together with 3 new species.

3. Subgenus. *Carterispongia*, Ridley, including forms of *Spongia* and *Halispongia*, and 3 new species.

Genus. *Leiosella*, n. g., pp. 201–208, including species of *Euspongia*, *Spongia*, and 4 new species.

Genus. *Euspongia*, Bronn, including as additions to the genus, species of *Cacospongia*, many *Spongia*, Hyatt, *Coscinoderma*, *Stelospongius*, 2 new species, and 6 new varieties.

Genus. *Hippospongia*, Schulze, including species of *Halme*, *Euspongia*, *Spongia*, *Aulena*, *Aphrodite*, together with 6 new species and 5 new varieties.

Genus. *Coscinoderma*, Carter, including species of *Spongelia*, *Euspongia*, and 1 new species.

Subfam. II. *APLYSININÆ*.

Genus. *Thorecta*, n. g., p. 326, *seq.*, including species of *Cucospongia*, *Spongelia*, *Spongia*, *Pseudoceratina*, *Stelospongius*, together with 17 new species and 2 new varieties.

Genus. *Thorectandra*, n. g., p. 369, *seq.*, with *Thorectandra chrounoides* (*Halispongia chrounoides*, Bowerbank), and 1 new species.

Genus. *Aplysinopsis*, n. g., p. 374, *seq.*, with 3 new species.

Genus. *Luffaria*, Poléjaeff, including 2 new species.

Genus. *Aplysina*, Nardo, including species of *Ferrissina*, *Dendrospongia*, together with 10 species.

Subfam. III. DRUINELLINÆ, n. subfam.

Genus. *Druinella*, n. g., p. 425, *seq.*, with 1 new species.

Subfam. IV. HALMINÆ, n. subfam.

Genus. *Oligoceras*, Schulze, including species of *Pseudoceras*.

Genus. *Dysideopsis*, n. g., p. 433, *seq.*, including species of *Coccinoderma*, *Dysidea*, *Hircinia*, *Cacospongia*, together with 4 new species.

Genus. *Halme*, Lendenfeld, including species of *Halma* and *Aulena*.

Subfam. V. STELOSPONGINÆ, n. subfam., p. 468.

Genus. *Stelospongia*, Schmidt, with 27 species, including species of *Cacospongia*, *Stelospongius*, *Spongia*, 13 new species, and 4 new varieties.

Genus. *Hircinia*, Nardo.

Subgenus. *Euricinia*, n. subg., with 4 species (2 new) and many varieties.

Subgenus. *Hircinella*, n. subg., with species of *Stelospongia* and *Oligoceras*.

Subgenus. *Dysidicina*, n. subg., with species of *Stelospongia* and *Stelospongius*.

Subgenus. *Sarcotragus*, Schmidt, with *Hircinia* *f. Filifera favosa*, Lieberkühn) and 3 new species.

Subgenus. *Psammocinia*, n. subg., with species of *Filifera* and *Cacospongia*, and 6 new species.

Subgenus. *Polyfibrospongia*, with *Hircinia* *g. horrens* partim, Ridley, *Cacospongia* *irregularis* partim, Poléjaeff).

Fam. III. SPONGELIDÆ, Schulze.

Subfam. I. PHORIOSPONGINÆ, Marshall.

Genus. *Phoriospongia*, Marshall, including in addition 1 species of *Dysidea*.

Genus. *Sigmatella*, n. g., p. 605, *seq.*, including forms described as *Dysidea* by Bowerbank, Carter, and Marshall; as *Psammascus* by Marshall; as *Hoplosamma* and *Hircinia* by Carter; *Spongelia* by Hyatt; 1 new species and 2 new varieties.

Subfam. II. SPONGELINÆ.

Genus. *Haastia*, n. g., p. 626, *seq.* *H. navicularis*, n. sp.

Genus. *Psammopenna*, Marshall, including some of Carter's *Hircinia*, *Pseudoceratina*, and *Aplysina*, Ridley's *Dysidea digitifera*, and some of Carter's *Hoplosamma*, together with 3 new species.

Genus. *Spongelia*, Nardo. There are added to this genus nearly the whole of *Dysidea*, *Sarcocornea nodosa*, Carter, 3 new species, and 1 new variety.

Order II. HEXACERATINA, n. ord., p. 672.

Fam. I. *DARWINELLIDÆ*, Merejkowsky, emend.

Genus. *Darwinella*, Müller.

Fam. II. *APLYSILLIDÆ*, Lendenfeld, emend.

Genus. *Janthella*, Gray.

Genus. *Aplysilla*, Schulze, with 1 new species.

Genus. *Dendrilla*, Lendenfeld.

Fam. III. *HALISARCIDÆ*, Lendenfeld.

Genus. *Bajulus*, Lendenfeld.

Genus. *Halisarca*, Dujardin.

27. MAAS, O. Zur Metamorphose der *Spongilla* larve. Zool. Anz. 1889, No. 316, pp. 483-487, woodcut; also J. R. Micr. Soc. 1889, 6, pp. 765 & 766.

The ectoderm of the larva passes over, after a series of metamorphic changes, into the epithelium of the young Sponge.

28. MARENZELLER, E. V. Ueber die adriatischen Arten der Schmidt'schen Gattungen *Stellata* und *Ancorina*. Ann. Hofmuseum Wien, IV, i, pp. 7-20, pls. ii & iii.

The author describes many of the species of these genera, including (p. 15) a new species of *Ancorina*. The genera are discussed from an historical standpoint.

29. MEUNIER, S. Sur la *Spongeliomorpha Saportai*, espèce nouvelle parisienne. C.R. cix, pp. 536 & 537.

A ramifying form from the Chalk.

30. MILLER, S. A. North American Geology and Palæontology. Cincinnati, Ohio: 1889. Protozoa. Porifera, pp. 152-167, figs. 89-127.

Contains alphabetical list of genera and species. Diagnoses of *Anthaspidella*, n. g. (Ulrich), *Batospongia*, n. sp. (Ulrich), *Belemnospongia*, n. sp. (Ulrich), *Chirospongia*, n. g., *C. faberi*, n. sp., *C. wenti*, n. sp., *Hystri-spongia*, n. g. (Ulrich), *Strotospongia*, n. g. (Ulrich & Everett), *Zittellella*, n. g. (Ulrich & Everett).

31. MILLS, H. Fresh-Water Sponges. J. Micr. & Nat. Sci. n.s., II, 6, pp. 82-85.

32. MORTON, G. H. On the Discovery of Sponge Spicules in the Chert Beds of Flintshire. P. Liverp. Biol. Soc. i, 1887, p. 69.

The spicules belong to the *Monactinellidæ* and *Tetractinellidæ* (?).

33. NEUMAYR, M. Die Stämme des Thiereichs. Wirbellose Thiere I. Wien & Prag: 1889. Cap. 3. Cœlenteraten. Spongien, pp. 211-237, figs. 35-44.

34. POLÉJAEFF, N. Über *Korotnewia desiderata* und die Phylogenie Hornschwämme. Zool. Anz. 1889, No. 311, pp. 366 & 367; also R. Micr. Soc. 1889, 5, p. 649.

The Horny Sponges are to be considered an ancient group sprung from one stock.

35. —. Spongiologicheskies Étjudbi. Trudni St. Petersburg 1889, xx, 2, pp. 139-220, pl. i & ii.

The paper is divided into 5 parts:—Part ii, pp. 159-171, deals with spermatogenesis of *Porifera*. Part iii, pp. 172-179, with the classification system of the *Chalinidæ*. Part v with *Korotnewia desiderata*, n. g. & n. sp.

36. POTTS, E. Report upon some Fresh-water Sponges collected in Florida, by J. Wilcox, Esq. Trans. Wagner Inst. Philad. ii, 1889, pp. 5-7; also J. R. Micr. Soc. 1890, i, pp. 49 & 50.

Spongilla wagneri, n. sp., is described.

37. SCHNEIDER, R. Über Eisen-Resorption in thierischen Organen und Geweben. Abh. Ak. Berl. 1888, (Phys. Abth. ii), *Calenterata*, 10 & 11.

The effects observed in *Spongilla lacustris* are recorded under head.

38. SCHULZE, F. E. On the organization and mode of living of Sponges. Delivered before the Physiological Society of Berlin, Feb. 1889. Nature, xxxix, pp. 479 & 480.

39. —. Zur Stammesgeschichte der Hexactinelliden. Abh. Ak. Berl. 1887 (Phys. Math. Cl. Abth. i), pp. 1-35, with 2 phylogenetic "trees," and 4 woodcuts.

The author considers that the *Amphidiscophora* (*Hyalonematida*) diverged early from the remainder (*Hexasterophora*); that these latter consist of two main stems, the one comprising *Asconematidæ*, *Rosellidæ*, *Fulectellidæ*, and, *magno intervallo*, *Meandrospongidæ*; the other (*Uncinataria*) comprising (a) *Clavularia* (*Farreidæ*), and (b) *Scopulidæ* (*Euretidæ*, *Melittionidæ*, *Coscinoporidæ*, *Tretodictyidæ*). The form and composition of the spicules, with regard to classification, and the general relations of the main groups of Sponges discussed.

40. SOLLAS, W. J. On the Geodine genera, *Synops*, *Vosm.*, and *Sidon*. A correction. Sci. P. R. Dubl. Soc. vi, 5, pp. 276 & 277.

The pores of *Synops*, *Vosm.*, are simple, and not sieve-covered. Consequently the author substitutes genus *Sidonops*, including *Sidon neptuni*, Soll., *S. nitida*, *S. vosmæri*, *S. macandrewii*; *Synops pyriformis*, *Vosm.*, becomes *Isops pyriformis*. These are corrections to Chall. R. xxv, pp. cxlix, pp. 227, 231, 234, 265, & 266.

41. SOVINSKII, V. O Bodyaghakh' (*Spongillidæ*) Vstryechayuschchikhsya Dnyepye Podye Kievomye. Zapiski Kiev. x, i, pp. 43-72, pls. ii & iii.

Contains descriptions and discussions of *S. lacustris*, *sibirica*, *Ephyda fluviatilis* (Gray), and *E. mülleri*.

42. TOPSENT, E. Quelques Spongiaires du Banc de Campêche et de la Pointe-a-pître. Mem. Soc. Zool. Fr. II, i, pp. 30-52, 12 woodcuts.

Describes new species of *Aciculites*, *Papillina*, *Clathria*, *Hymenapha*, *Hymedesmia*, *Amorphina*, *Fibularia*, *Darwinella*, *Tedania*.

43. TRAXLER, L. A Magyarhouban eddig tapasztalt édesvízi szivacsok (*Spongillidae*) rendszeres jegyzéke (Enumeratio systematica Spongillidarum Hungariæ). Term. füzetek. XII, i, 1889, pp. 13-16.

44. ULRICH, E. O. Preliminary Description of New Lower Silurian Sponges. Am. Geol. iii, 1889, pp. 233-248, with woodcut.

A new Hexactinellid genus *Rauffella*, with 2 new species is described; and *Leptopoterion*, n. g., with 1 new species, doubtful Hexactinellid. New genera of *Calcispongia* are described: *Heterospongia*, n. g., with 3 new species; *Saccospongia*, n. g., with 2 new species; *Streptospongia*, n. g., with 1 new species; *Cylindrocalia*, n. g., with 4 new species. A new *Dystactospongia*, and a new *Hindia* are described.

45. VOSMAER, G. C. J. Systematik der Spongien. (Neue Arbeiten über Schwämme.) Biol. Centralbl. ix, 13, pp. 405-414. A notice and criticism of Sollas' "Report on the *Tetractinellida*, collected by H.M.S. 'Challenger'"; Challenger Reports, xxv, and "Sponges" in Encycl. Brit. 9th Ed.

The author concludes that the following modification must be made in the classification:—

Typus. PORIFERA.

Class I. PORIFERA INCALCARIA.

Subclass I. HEXACTINELLIDA.

Subclass II. DEMOTERELLIDA.

Order i. *Spiculispongiae*.

Order ii. *Cornacuspungiae*.

Class II. PORIFERA CALCARIA.

46. —. Neuere Arbeiten über Schwämme (*Hyalospongiae*). Biol. Centralbl. viii, pp. 38-45.

A brief notice of F. E. Schulze's "Report on the *Hexactinellida* collected by H.M.S. 'Challenger,' during the years 1873-1876"; Challenger Reports, xxi. "Ueber den Bau und das System der Hexactinelliden," Abh. Ak. Berl. 1886. "Zur Stammesgeschichte der Hexactinelliden," Abh. Ak. Berl. 1887.

47. WIŚNIEWSKI, T. Nowy przyczynek do znajomości górnójurajskich Monactinellidów i Tetractinellidów. Komos Lemberg, xiv, 1889, vii-viii, pp. 230-237, 1 pl.

Among the *Monactinellida* there are described and figured a new *Reniera*, *Triposphaerilla*, n. g., with 1 new species, and an undetermined genus of *Desmacidonida*, and among the *Tetractinellida* an undetermined genus of *Placinidæ* or *Corticidæ*, p. 233.

48. ZAHÁLKA, C. *Camerospongia monostoma*, Röm. sp. zoeakého útvaru křídového. SB. böhm. Ges. 1889, i, pp. 88-90, pl. iii.

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- Heterospongia*, n. g., p. 239 ; *H. subramosa*, n. sp., p. 240 ; *H. knotti*, n. sp., p. 241 ; *H. aspera*, n. sp., p. 241 ;
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EURYTIDÆ, Zittel.

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Papillina arcuata, n. sp., p. 35 ;
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Tribe *Megasclerophora*, n. tribe ;
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Suborder. *CLAVULINA*.

Tribe. *THALASSOSPONGIÆ*, n. tr., LENDENFELD

Acanthella carteri, n. sp., p. 93 ; DENDY (5).
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Azinella labyrinthica, n. sp., p. 88 ; DENDY (5).
Hemiostellinae, n. fam. *Spirophorellinae*, n. fam.
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Latrunculia magnifica, n. sp., p. 402 ;
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n. sp., p. 389 ; *C. granulata*, n. sp., p. 390. KELLER (19).

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Cucochalina calyx, n. sp., p. 375 ; *C. maculata*, n. sp., p.
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Sclerochalina crassa, n. sp., p. 377 ;

- Reniera teligera*, n. sp., p. 50. TOPSENT (42).
Reniera moniliformis, n. sp., p. 235;
Triposphærilla, n. g.; *T. pocula*, n. sp., p. 235. WISNIOWSKI (47).
Clathria fascicularis, n. sp., p. 35; *C. dentata*, n. sp., p. 37;
C. carteri, n. sp., p. 38; *C. foliacea*, n. sp., p. 37; *C. copiosa*, n. sp., p. 40.
 TOPSENT (42).
Clathria indica, n. sp., p. 84; *C. corallitincta*, n. sp., p. 85; *Rhaphi-*
dophlus spiculosus, n. sp., p. 86; *Hymeniacion fætida*, n. sp., p. 87;
Ciocalypta tyleri, Bowbk., var. *manaarensis*, n. var., p. 91; *Auletta*
aurantiaca, n. sp., p. 92. DENDY (5).
Microciona spinarcus, n. sp. CARTER & HOPE (4). British.
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Tribe. POTAMOSPONGIÆ.

- Spongilla wagneri*, n. sp., p. 7. POTTS (36).

Class. SILICEA.

Subclass. TETRAXONIA.

Order. CORNACUSPONGIÆ.

AULENIDÆ.

- Hyattella*, n. g., pp. 102-121; *Hyattella globosa*, n. sp., p. 111; *H. modissima*, n. sp., p. 111; *H. obscura*, n. sp., p. 112; *H. micropora*, n. sp., p. 112; *H. tenella*, n. sp., p. 113; *H. polyphemus*, n. sp., p. 114; *H. arborea*, n. sp., p. 114; *H. tubaria*, n. sp., p. 117; *H. meander*, n. sp., p. 118; *H. murrayi*, n. sp., p. 120;
Hyattella, n. g., also includes *Hippospongia sinuosa*, var. *decidua*, Ridley; *Hircinia clathrata*, Carter; *Hippospongia intestinalis*, Ridley; *H. sinuosa*, var. *mauritiana*, Ridley. LENDENFELD (26).

Fam. DESMACIDONIDÆ.

- Subfam. *Ectyonidæ*. *Acarnus wolffgangi*, n. sp., p. 399. KELLER (19).

Fam. HETERORHAPHIDÆ.

- Tedania leptoderma*, n. sp., p. 49. TOPSENT (42).

Fam. PHORIOSPONGINÆ.

- Phoriospongia*. *P. levis*, n. sp., p. 598; *P. canaliculata*, n. sp., p. 602; *P. lamella*, n. sp., p. 603, var. *panis*, n. var., p. 604, var. *osculata*, n. var., p. 604;

Phoriospongia to include *P. chaliniformis* (= *Dysidea chaliniformis*, Carter);

Sigmatella, n. g., pp. 605-611; *S. australis*, var. *flabellum*, n. var., p. 611; *S. carcinophila*, n. sp., p. 615; *S. corticata*, var. *flabellum*, n. var.;

Haastia, n. g., pp. 626-628; *H. navicularis*, n. sp., p. 628;

Psammopemma marshalli, n. sp., p. 635; *P. tuberculatum*, n. sp., p. 635; *P. rugosum*, n. sp., p. 639;

Spongelia gracilis, n. sp., p. 654; *S. fragilis*, var. *implexa*, n. var., p. 666. LENDENFELD (26).

Fam. AMMOCONIDÆ, n. fam., p. 23. HÆCKEL (13).

Genus. *Ammolynthus*, n. g. *A. prototypus*, n. sp., p. 27. *A. halphysenia*, n. sp., p. 28.

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Genus. *Ammonoconia*, n. g., p. 30. *A. auloplegma*, n. sp., p. 31. *A. sagenella*, n. sp., p. 31.

Fam. PSAMMINIDÆ, Lendenfeld.

Genus. *Psammina*, n. g., p. 34. *P. plakina*, n. sp., p. 35. *P. globigerina*, n. sp., p. 36. *P. nummulina*, n. sp., p. 37.

Genus. *Holopsamma*, Carter. *H. cretaceum*, n. sp., p. 39. *H. argillaceum*, n. sp., p. 39.

Genus. *Psammopemma*, Marshall. *P. radiolarium*, n. sp., p. 41. *P. calcareum*, n. sp., p. 41.

Fam. STANNOMIDÆ, n. fam., p. 54.

Genus. *Stannophyllum*, n. g., p. 60. *S. zonarium*, n. sp., p. 62. *S. radiolarium*, n. sp., p. 65. *S. pertusum*, n. sp., p. 65.

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Genus. *Stannarium*, n. g., p. 69. *S. alatum*, n. sp., p. 70. *S. concretum*, n. sp., p. 71.

Genus. *Stannoma*, n. g., p. 72. *S. dendroides*, n. sp., p. 72. & *coralloides*, n. sp., p. 73.

Fam. SPONGELIDÆ, Lendenfeld.

Genus. *Cerelasma*, n. g., p. 45. *C. gyrosphaera*, n. sp., p. 46. *C. lamellosa*, n. sp., p. 47.

Genus. *Psammophyllum*, n. g., p. 49. *P. reticulatum*, n. sp., p. 50. *P. frustraceum*, n. sp., p. 51. *P. annectens*, n. sp., p. 53. HÆCKEL (13).

Spongelia distans, n. sp., p. 668; *Spongelia laxa*, n. sp., p. 671. LENDENFELD (26).

Spongelia herbacea, n. sp., p. 336. KELLER (19).

Spongeliomorpha saportai, n. sp. MEUNIER (29).

Fam. SPONGIDÆ.

Subfam. EUSPONGINÆ.

Chalinopsilla, n. g., pp. 124-133;

Chalinopsilla clavata, n. sp., p. 134; *C. radix*, n. sp., p. 135; *C. australis*, n. sp., p. 136; *C. australis*, var. *reticulata*, n. var., p. 137; *C. elegans*, n. sp., p. 140; *C. candelabrum*, n. sp., p. 141; *C. arborea*, var. *massa*, n. var., p. 153;

Chalinopsilla tuba (= *Velinea gracilis*, Vosmaer); *C. australis*, var. *repens* (= *Chalina oculata*, var. *repens*, Carter); *C. imitans* (= *Chalinopsis dichotoma*, Lend.);

C. repens (= *Euspongia repens*, Lend.); *C. paraspongia* (= *Peraspongia laxa*, Carter); *C. impar* (= *Dactylia impar*, Carter); *C. arborea*, var. *micropora* (= *Tuba compacta*, Hyatt); *C. arborea*, var. *macropora* (= *Tuba confusa*, Hyatt); *C. arborea*, var. *ramosa* (= *Psammoclema ramosum*, Poléjaeff. LENDENFELD (26).

Heteronema, n. g., p. 339; *H. erecta*, n. sp., p. 340. KELLER (19).

Antheroplax, n. subg., p. 171;

Phyllospongia macropora, n. sp., pp. 173 & 174; *P. torresia*, n. sp., p. 176; *P. dendyi*, n. sp., p. 179;

Phyllospongia dendyi, var. *frondosa*, n. var., p. 178;

Phyllospongia dendyi, var. *digitata*, n. var., p. 178;

Phyllospongia ridleyi, n. sp., pp. 178 & 179, var. *typica*, n. var., p. 179, var. *meander*, n. var., p. 180;

Phyllospongia schulzei, n. sp., p. 183;

Phyllospongia fissurata, n. sp., p. 186; *P. distans*, n. sp., p. 189; *P. arbuscula*, n. sp., p. 190;

Phyllospongia elegans, n. sp., p. 192; *P. spiralis*, n. sp., p. 200;

P. vermicularis, n. sp., p. 201;

Carteriospongia, Ridley, to include *Phyllospongia permatula* (= *Spongia permatula*, Lam.); *P. foliascens* (= *Spongia foliascens*, Pallas); *P. silicata* (= *Spongia plicata*, Esper.); *P. mantelli* (= *Halispongia mantelli*, Bwbk.). LENDENFELD (26).

Carteriospongia cordifolia, n. sp., p. 352;

Leiosella, n. g., pp. 201-208;

Leiosella elegans, n. sp., pp. 212 & 213; *L. illawarra*, n. sp., p. 215; *L. flabellum*, n. sp., pp. 218 & 219; *L. caliculata*, n. sp., p. 221;

Leiosella, n. g., to include *L. compacta* (= *Euspongia compacta*, Carter, Lend.); *L. pulchella* (= *Spongia pulchella*, Bwbk.); *L. levis* (= *Euspongia levis*, Lend.); *L. silicata* (= *Euspongia silicata*, Lend.); *L. foliacea* (= *Euspongia foliacea*, Ridley, Lend.);

Euspongia. *E. irregularis* var. *fistulosa*, n. var., p. 249, var. *dura*, n. var., p. 251, var. *villosa*, n. var., p. 252, var. *frondosa*, n. var., p. 253; *E. hospis*, n. sp., p. 257; *E. excavata*, n. sp., p. 260; *E. officinalis* var. *perforata*, n. var., p. 271, var. *spinosa*, n. var., p. 273. *Euspongia* to include: *E. irregularis* var. *mollior* (= *Cacospongia mollior*, Schmidt, Ridley); *E. denticulata* (= *Coscinoderma denticulatum*, Poléj.); *E. pikei* (= *Stelospongius pikei*, Hyatt). LENDENFELD (26).

Hippospongia. *H. densa*, n. sp., p. 296; *H. laxa*, n. sp., p. 297; *H. dura*, n. sp., p. 298; *H. cerebrum*, n. sp., p. 300; *H. osculata*, n. sp., p. 302; *H. equina* var. *massa*, n. var., p. 305, var. *micropora*, n. var., p. 309; *H. mollissima*, n. sp., p. 310; *H. canaliculata* var. *typica*, n. var., p. 323, var. *cylindrica*, n. var., p. 323, var. *microtuba*, n. var., p. 225; *Hippospongia* to include: *H. tingens* (= *Halme tingens*, Lend.); *H. reticulata* (= *Euspongia reticulata*, Lend.); *H. equina*, var. *cerebriformis* (= *Spongia equina*, subsp. *cerebriformis*, Hyatt); *H. equina*, var. *mæandriniformis* (= *Spongia equina*, subsp. *mæandriniformis*, Hyatt); *H. equina*, var. *elastica* (= *Euspongia*

equina, Schmidt); *H. galea* (= *Euspongia galea*, Lend.); *H. nigra* (= *Aulena nigra*, Lend.); *H. aphroditella* (= *Aphrodite nardorus*, Lend.); *H. fistulosa* (= *Euspongia officinalis*, var. *cavernosa*, Lend.); *H. canaliculata* (= *Euspongia canaliculata*, Lend.); *H. canaliculata*, var. *dura* (= *Euspongia canaliculata*, var. *dura*, Lend.); *H. canaliculata*, var. *elastica* (= *Euspongia canaliculata*, var. *elastica*). *H. canaliculata*, var. *mollissima* (= *Euspongia canaliculata*, var. *mollissima*, Lend.); *H. canaliculata*, var. *gossypina* (= *Spongia gossypina*, Duch. & Mich.); *H. canaliculata*, var. *flabellum* (= *Spongia graminea*, Hyatt). LENDEN-FELD (26).

Coscinoderma polygonum, n. sp., p. 331;

Coscinoderma to include: *C. pyriforme* (= *Spongela incerta*, Hyatt); *C. matthewsii* (= *Euspongia matthewsii*, Lend.);

Thorecta, n. g., pp. 326-346; *Thorecta pumilus*, n. sp., p. 347; *T. squilidus*, n. sp., p. 348; *T. cacos*, n. sp., p. 349; *T. murrayella*, n. sp., p. 349; *T. radiatus*, n. sp., p. 350; *T. meandrinus*, n. sp., p. 350; *T. tuba*, n. sp., p. 351; *T. donar*, n. sp., p. 352; *T. wootan*, n. sp., p. 352; *T. carteri*, n. sp., p. 355; *T. exemplum*, var. *prima*, n. var., p. 357, var. *marginalis*, n. var., p. 361; *T. laxus*, n. sp., p. 362; *T. madagascarensis*, n. sp., p. 363; *T. gracillinus*, n. sp., p. 363; *T. haackei*, n. sp., p. 364; *T. lobosus*, n. sp., p. 365; *T. freija*, n. sp., p. 366; *T. dendroides*, n. sp., p. 368; *Thorecta* to include: *F. murrayi* (= *Cacospongia murrayi*, Poléj.); *T. furlovii* (= *Spongelia furlovii*, Hyatt); *T. exemplum*, var. *secunda* (= *Spongelia reticulinea*, var. *tenuis*, Hyatt), var. *tertia* (= var. *recta*, Hyatt); *T. byssoides* (= *Spongia byssoides*, Lamarck); *T. crateriformis* (= *Pseudocraterium crateriformis*, Carter); *T. galeiformis* (= *Spongelia dubia*, var. *excavata*, Hyatt); *T. tuberculatus* (= *Stelospongia tuberculatus*, Carter);

Thorectandra, n. g., pp. 369-372;

Thorectandra corticatus, n. sp., p. 372;

Thorectandra to include *T. choanoides* (= *Haliapongia choanoides*, Bwbk.);

Aplysinopsis, n. g., pp. 374-378;

Aplysinopsis elegans, n. sp., p. 379; *A. pedunculata*, n. sp., p. 380; *A. digitata*, n. sp., p. 381;

Luffuria tubulosa, n. sp., p. 388; *L. calyz*, n. sp., p. 389;

Aplysina minuta, n. sp., p. 404; *A. spiculifera*, n. sp., p. 406; *A. grisea*, n. sp., p. 406; *A. ramosa*, n. sp., p. 411; *A. procumbens*, n. sp., p. 416; *A. reticulata*, n. sp., p. 416; *A. meandrina*, n. sp., p. 418; *A. hippocampus*, n. sp., p. 419; *A. holda*, n. sp., p. 421; *A. apengelii*, n. sp., p. 421; *Aplysina* to include: *A. zetlandica* (= *Verongia zetlandica*, Bwbk.); *A. flagelliformis* (= *Hircinia flagelliformis*, Carter); *A. archeri* (= *compacta*, Carter, *Verongia tenuissima*, Hyatt); *A. hirsuta* (= *Verongia hirsuta*, Hyatt); *A. fistularis* (= *Verongia fistulosa*, Bwbk.); *A. crassa* (= *pedicellata*, Hyatt, fuscus, Ridley, Carter, *Dendrospongia crassa*, Hyatt). LENDEN-FELD (26).

Korotnewia, n. g., *K. desiderata*, n. sp., pp. 190, et seqq. POLÉJAEFF (35).

Druinellina, n. subfam., p. 425;

Druinella, n. g., pp. 425-427;

Druinella rotunda, n. sp., p. 427;

Halminæ, n. subfam., p. 428 ;

Dysideopsis, n. g., pp. 433-439 ; *D. elegans*, n. sp., p. 441 ; *D. compacta*, n. sp., p. 442 ; *D. digitata*, n. sp., p. 443 ; *D. marshalli*, n. sp., p. 445 ; *Dysideopsis* to include : *D. alta* (= *Coscinoderma altum*, Poléj.) ; *D. fusca* (= *Dysidea fusca*, Ridley) ; *D. gumminæ* (= *Dysidea gumminæ*, Ridley) ; *D. solida* (= *Hircinia solida*, Carter) ; *D. oligoceros* (= *Cacospongia oligoceros*, Poléj.). LENDENFELD (26).

Dysidea cinerea, n. sp., p. 337 ; *D. nigra*, n. sp., p. 338. KELLER (19).

Oligoceras to include : *O. foliaceum* (= *Psammoclema foliaceum*, Poléj.) ; *A. vosmæri* (= *Psammoclema vosmæri*, Poléj.) ;

Halme to include : *H. irregularis* (= *Holopsamma laminæfurosa*, pars, Carter) ; *H. villosa* (= *Aulena villosa*, Lend.) ; *H. flabellum* (= *Aulena flabellum*, Lend.). LENDENFELD (26).

Halme robusta, n. sp., p. 354. KELLER (19).

Stelospongingæ, n. subfam., p. 468 ;

Stelospongia sarta, n. sp., p. 489 ; *S. scalatella*, n. sp., p. 490 ; *S. retiformis*, n. sp., p. 490 ; *S. chaliniformis*, n. sp., p. 493 ; *S. kingii*, n. sp., p. 494 ; *S. canalis*, n. sp., p. 495 ; *S. implexu*, n. sp., p. 497 ; *S. laxa*, n. sp., p. 498 ; *S. lordii*, n. sp., p. 503 ; *S. caliculata*, n. sp., p. 503 ; *S. ondatajeana*, n. sp., p. 504 ; *S. cavernosa*, var. *pyriformis*, n. var., p. 509, var. *rigida*, n. var., p. 510 ; *S. reticulata*, n. sp., p. 510 ; *S. crassa*, n. sp., p. 511 ; *S. cyni*, n. sp., p. 512 ; *S. australis*, var. *canaliculata*, n. var., p. 521, var. *villosa*, n. var., p. 522 ; *S. pulcherrima*, n. sp., p. 525 ; *Stelospongia* to include : *S. scalaris* (= *Cacospongia scalaris*, Schmidt) ; *S. excavata* (= *Stelospongius excavatus*, Ridley) ; *S. vesiculiferu* (= *Cacospongia vesiculifera*, Poléj.) ; *S. rimosa* (= *Spongia rimosa subclavata*, Lamouroux) ; *S. vallatu* (= *Stelospongius maynhardii*, pars, Hyatt) ; *S. cellulosa* (= *Spongia cellulosa*, Ellis) ; *S. flabellum* (= *Stelospongius flabelliformis*, Carter) ; *S. intertexta* (= *Stelospongius intertextus*, Hyatt, Ridley) ; *S. aspergillum* (= *Cacospongia aspergillum*, Schmidt) ; *S. cavernosa*, var. *mediterranea* (= *Spongia*, Ehlers, *Cacospongiu*, Ridley, *cavernosa*) ; *S. australis*, var. *conulata* (= *Stelospongius levis*, Hyatt), var. *fovea* (= *Cacospongia amorpha*, Poléj.), var. *levis* (= *Cacospongia levis*, Poléj.), var. *conulissima* (= *Stelospongius friabilis*, pars, Hyatt) ; *S. costifera* (= *Spongia costifera*, Lamarck). LENDENFELD (26).

Euricinia, n. subg., p. 554 ; *Hircinia cactus*, n. sp., p. 554 ; *H. rubra*, n. sp., p. 556 ;

Hircinella, n. subg., p. 565 ; *Dysidicina*, n. subg., p. 565 ;

Hircinia arbuscula, n. sp., p. 571 ; *H. caliculata*, n. sp., p. 572 ; *H. australis*, n. sp., p. 573 ; *Psammocinia*, n. subg., p. 579 ; *Hircinia irregularis*, n. sp., p. 579 ; *H. tenella*, n. sp., p. 580 ; *H. vallata*, n. sp., p. 581 ; *H. rugosa*, n. sp., p. 582 ; *H. arenosa*, n. sp., p. 583 ; *H. halmiformis*, n. sp., p. 586 ; *Hircinia* to include : *H. collectric* (= *Cacospongius collectric*, Poléj.) ; *H. conulosa* (= *Oligoceras conulosum*, Ridley) ; *H. friabilis* (= *Cacospongia dendroides*, var. *friabilis*, Poléj.) ; *H. procumbens* (= *Cacospongia procumbens*, Poléj.) ; *H. longispina* (= *Stelospongius longispinus*, Poléj.) ; *H. fuvosa* (= *Filifera fuvosa*, Lieberkuhn) ; *H. verrucosa* (= *Filifera verrucosa*, Lieberk.) ; *H. compacta* (= *Cacospongius compacta*, Poléj.) ; *H. gigantea* (= *H. horrens*, partim, Ridley, *Cacospongia*

irregularis, partim, Poléj.). *Id.* (26). *H. ramosa*, n. sp., p. 34
virens, n. sp., p. 346; *H. echinata*, n. sp., p. 347. KELLER (1)
Spongionella nigra, n. sp., p. 34; *Hircinia* (?) sp., p. 96. D

Order HEXACERATINA, n. ord., p. 672.

Fam. DARWINELLIDÆ, LENDENFELD (26).

Darwinella joyeuxi, n. sp., p. 46. TOPSENT (42)

Fam. APLYSILLIDÆ.

Aplysilla lacunosa, n. sp., p. 356. KELLER (19).

Aplysilla pallida, n. sp., p. 706;

Dendrilla elegans, n. sp., p. 714; *D. ianthelliformis*, n. sp., p.
 DENFELD (26).

Psammaplysilla arabica, n. sp., p. 358. KELLER (19).

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Anthaspidella, n. g. (Ulrich), p. 153;

Batospongia, n. sp. (Ulrich), p. 154;

Belenmospongia, n. sp. (Ulrich), p. 155;

Chirospongia, n. g., p. 156; *C. faberi*, n. sp., p. 156; *C.* *ae*
 p. 157;

Hystrispongia, n. g. (Ulrich), p. 160;

Strotospongia, n. g. (Ulrich & Everett), p. 166;

Zittellella, n. g. (Ulrich & Everett), p. 167, syn. for *Pal*
 MILLER (30).

PROTOZOA.

BY

CECIL WARBURTON, B.A.

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Catalogue of the fauna found in three adjacent mountain lakes—Partnun, Tilisuna, Sarschina—comprising some *Protozoa*.

II.—SYSTEMATIC.

A.—GYMNOMYXA.

MÖBIUS (1) describes some *Rhizopoda* from Kiel Bay.

Class 1.—PROTEOMYXA.

Pseudochlamys aculeata, n. sp., GREEF, p. 104.

Diplochlamys, n. g., with n. sp. *leidy*, id. p. 104.

Assulina muscorum, n. sp., id. p. 117.

Class 3.—LOBOSA.

Amæba ventriculi, n. sp., MAGGI, (1) p. 379. Found in the stomach of a dog during digestion of bread and milk, in company with *A. albuminis* and several microbes.

Amæba prehensilis, n. sp., MÖBIUS, (1) p. 25, pl. v, figs. 55-58.

Class 5.—HELIOZOA.

PENARD (1, 2).

Vampyrella pallida, n. sp., MÖBIUS, (1) p. 10, pl. i, figs. 1-12b.

Acanthocystis pectinata, n. sp., PENARD, (2) p. 425, pl. xxx, fig. 1.

Acanthocystis erinaceus, n. sp., id. p. 455, pl. xxxi, fig. 23.

Acanthocystis albida, n. sp., id. p. 458, pls. xxxi, fig. 28, & xxxii, fig. 29.

Ciliophrys cerulea, n. sp., id. p. 459, pl. xxxii, figs. 30 & 31.

Class 6.—RETICULARIA.

GENERAL.

SHERBORN & CHAPMAN briefly describe 28 forms of *Foraminifera* from the London Clay, 21 of which are new to that formation. The species formerly described by these authors as *Lagena oviformis* (J. R. Micr. Soc. 1886, p. 745) they now consider to belong to the genus *Chilostomella*.

BAILEY mentions some *Foraminifera* found in hollow flints.

BURGESS describes 20 species of *Foraminifera* (none new) from Oban.

For Italian *Foraminifera*, see CAPELLINI.

CARTER (2) continues to discuss the genus *Orbitoides*.

WOODWARD publishes a preliminary list of *Foraminifera* from Post-pliocene Sand at Santa Barbara, California.

WRIGHT gives a list of species dredged off the S.W. coast of Ireland, and indicates the frequency of their occurrence.

MALAGOLI describes 16 species of *Foraminifera* (none new) from the neighbourhood of Modena.

See also DREYER (1), ELCOCK, FRIČ, HAÜSLER, TOLL.

a. IMPERFORATA.

Order GEOMIDEA.

- *Gromia gracilis*, n. sp., MÖBIUS, (1) p. 17, pl. iii, figs. 30–37b.

Order ASTORRHIZIDEA.

- *Masonella*, n. g., with n. spp. *M. planulata* and *M. patelliformis*; BRADY, p. 295, fig. 1, & p. 296, fig. 2.

b. PERFORATA.

Order LAGENIDEA.

Cristellaria burbachii, n. sp., DREYER, (1) p. 512, pl. xi, fig. 40, found by the author, together with other congeners, which he also describes, in the Middle Lias of Gotha.

Ramulina parasitica, n. sp., parasitic on *Orbitolites mantelli*; CARTER (1).

Order NUMMULINIDEA.

Nummulites of S.W. France; BENOIST.

See also DAWSON.

Class 7.—RADIOLARIA.

KIRKPATRICK, HÆCKEL, SHRUBSOLE.

B.—CORTICATA.

Class 1.—SPOROZOA.

a. GREGARINIDEA.

Gregarina philica, n. sp., in the proventriculus of *Nyctobates pennsylvanicus*; LEIDY.

Gregarina actinotus, n. sp., parasitic in a common Myriapod; *id.*

Gregarina megacephala, n. sp., parasitic in *Cermatia forceps*; *id.*

Gregarina microcephala, n. sp., in a beetle, *Holocephala bicornis*; *id.*

For *Gregarinidæ* in the blood of birds and of *Chelonia*, see DANILEWSKY.

See also LEIDY, MINGAZZINI, PFEIFFER.

b. COCCIDIIDEA.

See MCINTIRE.

c. MYXOSPORIDEA.

Cystodiscus immersus, n. sp., parasitic in the gall bladder of Brazilian frogs and toads. Apparently of no pathological significance. It possesses no power of spontaneous movement, nor is any nucleus visible. LUTZ.

Class 2.—FLAGELLATA.

GENERAL.

FABRE-DOMERGUE describes a new form, *Pronoctiluca pelagica*, found on the surface of the sea at Concarneau, which he considers to be intermediate between the *Flagellata* and the *Cystoflagellata*.

KÜNSTLER (1) gives a full and detailed account of the various known Flagellate forms.

For *Flagellata* in the blood of Birds and of *Chelonia*, see DANILEWSKY.

Anisonema viridis, n. sp., DANGEARD.

Trachelemonas crebea, n. sp., KELLICOTT, (3) p. 188 (from Buffalo, N.Y.).

Leptophrys villosa, n. sp., DE BRUYNE, p. 90.

Proteromonas dolichomastix, n. sp., in the green lizard of Gascony; KÜNSTLER (2).

Ancyromonas ruminantium, n. sp., from the paunch of the roebuck; CERTES (1).

Cyrtostomum (P) *grande*, n. sp., from Ontario, KELLICOTT, (3) p. 189, fig. 3.

Ectobiella plateau, n. g. & sp. An amœboid form parasitic on a Diatom. Its pseudopodia themselves digest food. DE BRUYNE, p. 91.

Gymnococcus gomphonemarum, n. sp., parasitic inside Diatoms. The forms observed were zoospore, amœboid, plasmodic, and cystic; *id.* p. 91.

Vampyrella radiosa, n. sp., with amœboid and cystic form; *id.* p. 91.

- Pseudospora benedeni*, n. sp., parasitic on the filaments of *Cladophora* ;
 1 *id.* p. 91.
Pseudospora edax, n. sp., on the same host ; *id.* p. 91.
Pseudamphimonas unciliatus, n. g. & sp., parasitic on *Debessa* ; *id.* p. 91.
Pseudamphimonas biciliatus, n. sp., parasitic on the roots of *Caulerpa* ;
id. p. 92.
Morularia dupliciformis, n. g. & sp., parasitic on marine diatoms ; *id.*
 p. 92.

Class 4.—RHYNCHOFLAGELLATA.

PLATE, POUCHET.

Class V.—CILIATA.

Order PERITRICHA.

- Vorticella rubristigma*, n. sp., KELLICOTT, (2) p. 564, pl. i, figs. 9 & 10.
Vorticella conosoma, n. sp., STOKES, p. 479, pl. x, fig. 6, parasitic on
 Rotifer.
Vorticella conochili, n. sp., parasitic on *Conochilus volvox* ; *id.* p. 479,
 pl. x, fig. 7.
Vorticella molesta, n. sp., parasitic on shell of water snail ; *id.* p. 479.
Vorticella lichenicola, n. sp., GREEF, p. 127.
Opercularia niagaræ, n. sp., parasitic on *Lernæocera cruciata*, which is
 itself parasitic on Rock Bass ; KELLICOTT, (2) p. 565.
Spathidiopsis socialis, n. g. & sp., living in small colonies of eight or
 ten in a nest on the surface of the water at Concarneau ; FABRE-
 DOMERGUE, (2) p. 305, pl. ii.
Rhabdostyla (?) *arborea*, n. sp., GREEF, p. 127.
Vaginicola terricola, n. sp., *id.* p. 128.
Pyxidium nutans, n. sp., parasitic on aquatic plants ; STOKES, p. 479,
 pl. x, fig. 5.
Pyxidium hebes, n. sp., parasitic on legs of *Asellus* ; KELLICOTT, (2)
 p. 563, pl. i, figs. 7 & 8.
Epistylis vittata, n. sp., parasitic on shell of *Physa* ; STOKES, p. 477,
 pl. x, fig. 1.
Epistylis elongata, n. sp., on rootlets of *Lemna* ; *id.* p. 477, pl. x, fig. 2.
Epistylis autumnalis, n. sp., on rootlets of *Lemna* ; *id.* p. 478, pl. x,
 fig. 3.
Epistylis ramosa, n. sp., *id.* p. 478, pl. x, fig. 4.
Opisthostyla globularis, n. sp., *id.* p. 481, pl. x, fig. 8.
Opisthostyla similis, n. sp., found on aquatic plants ; *id.* p. 481, pl. x,
 fig. 9.
Halais furcata, n. g. & sp., *id.* p. 481.
Lagenophrys singularis, n. sp., KELLICOTT, (3) p. 187, figs. 1 & 2.
Urostyla intermedia, n. sp., BERGH.

Order HYPOTRICHA.

- Stichotricha ampulla*, n. sp., allied to *S. secunda*, found on *Myrio-*
phyllum ; KELLICOTT, (2) p. 567.
Rhabdotricha terricola, n. g. & sp., GREEF, p. 133.

Order HOLOTRICHA.

Opalina cerebriformis, n. sp., FABRE-DOMERGUE, (2) p. 308, pl. ii.

Nassula picta, n. sp., GREEF, p. 130.

Colpoda henneyi, n. sp., FABRE-DOMERGUE (3).

Colpoda lucida, n. sp., GREEF, p. 129.

SCHIEWIAKOFF describes 25 species of *Holotricha*, including the following new species:—

Glaucoma macrostoma, n. sp. ;

Urozona, n. g., with n. sp. *U. bütschlii* ;

Balantiophorus, n. g., with n. sp. *B. minutus*.

Spatidium amphoriforme, n. sp., GREEF, p. 131.

Ophryoglena marginata, n. sp., *id.* p. 132.

Anoplophrya ceolosomatis, n. sp., parasitic in the alimentary canal of *Celosoma chlorostictum* ; ANDERSON.

See also SIMMONS (1).

Order HETEROTRICHA.

Balantidium gyrans, n. sp., from the intestine of an aquatic worm ; KELLICOTT, (2) p. 562, pl. i, figs. 5 & 6.

SCHUBERG (2) maintains that the genus *Conchophthirius* contains only the species *C. anodontæ* and *C. steenstrupii*, Stein, which he redescribes. He is disposed to remove this genus from the *Heterotricha* to Bütschli's *Isotrichina*.

Class 6.—ACINETARIA.

Order SUCTORIA.

BÜTSCHLI completes his "*Protozoa*" with a full account of *Suctorina*.

Sphaerophrya parva, n. sp., GREEF, p. 134.

Podophrya sp.? A new form (not named) taken in Calcutta ; SIMMONS (2).

See also KEPPEN.

INCERTÆ SEDIS.

Enchyliodon pellucidus, n. sp., KELLICOTT, (1) p. 561.

Dumitia libera, n. sp., KÜNSTLER & DE LUSTRAC.

III.—MORPHOLOGY AND LIFE-HISTORY.

GENERAL.

PENARD (1) considers that there is confusion with regard to endosarc and ectosarc of *Acanthocystidae*. He regards the mucilaginous zone as true ectosarc (p. 527). He has especially studied the development of the "needles" of these forms (p. 528), and concludes that they are covered, at least during their growth, with a mucilaginous substance in which they are formed. Their increase takes place at both base and summit. These animals progress by advancing and fixing pseudopodia, towards which the body is drawn. New anterior-superior pseudopodia are then brought

into play, so that a rolling motion is effected (p. 532). He also describes the ingestion of food (p. 534).

CARRIÈRE describes a *Trichodina* (? *pediculus*) living in the lateral canal of *Cottus gobio*, and feeding on its blood corpuscles, which migrate into the epidermis.

DEICHLER has confirmed his previous observations, not generally accepted, on the presence of parasitic *Ciliata* in the matter expectorated in whooping-cough. He describes their appearance and encystment. They probably have some pathological significance in the disease.

FABRE-DOMERGUE (1) maintains the existence of functional differentiation in certain unicellular organisms denied by MAUPAS. He considers that *Didinium nasutum* has a definite alimentary tract. The excretory system still more clearly exhibits differentiation, and is remarkably complex in *Cyrtostomum*.

In *Actinophrys sol* the axial filaments of the pseudopodia are sometimes completely dissolved by a process which Penard is forced to ascribe to the will of the animal. It moves much more energetically when stimulated by a bright light. Its so-called nucleus is vesicular, but possibly its contained nucleolus is the true nuclear body. The author corroborates BÜTSCHLI's observations on the formation of colonies, and finds, with BRANDT, that *A. sol* is infested with parasitic *Saprolegnia*. PENARD (2).

GRUBER (1) defends Weismann's view of the immortality of *Protozoa* against the strictures of MAUPAS. Maupas says that if conjugation does not take place, degeneration and death occur. But in the natural condition of life conjugation always does take place. Other criticisms of Maupas are discussed.

DANGEARD points out that animals contain chlorophyll in two ways:— (1) Apparently diffused in the protoplasm, but really confined to chromatophores, as in *Algæ*; e.g., *Euglenæ*, *Cryptomonadinæ*, *Volvocinæ*, &c. He is disposed to place these forms among the *Algæ*. (2) Confined to spherical corpuscles scattered throughout the protoplasm; e.g., *Paramæcium*, *Acanthocystis*, &c. Some think it due to parasitic *Algæ*. Dangeard thinks this view supported by the case of *Ophrydium versatile* (Infusorian), and by that of *Anisonema viridis*, the only Flagellate yet observed to contain chlorophyll.

SCHUBERG considers the so-called *Grassia ranarum* not a definite organism at all. Similar appearances result from scraping the mucous membrane of the frog.

PENARD (2) gives a very full description of the morphology and life-history of *Actinophrys sol*. He also describes a new form, *Acanthocystia pectinata*, at considerable length, and gives briefer accounts of other freshwater *Heliozoa*.

BERGH has observed micronuclei in *Urostyla*. He describes their structure, and that of the numerous nuclei.

Contractile Vacuole.

By collating the researches of zoologists and botanists HARTOG arrives at an explanation of the contractile vacuole. Protoplasm contains in its

interstices highly osmotic substances. The outer layer of a naked protoplasmic organism, though freely pervious to water, is impervious to these substances. Water, therefore, is constantly passing to the interior, and vacuolation occurs. A disruptive tension is thus set up which would destroy the organism unless checked. The check may take the form of a strong cellulose or chitinous cell wall, or of a periodic contraction of the protoplasm expelling the contents of the vacuole.

PENARD (2) finds no communication between the contractile vacuole and the exterior in *Actinophrys sol*.

Skeletal Tissues.

Those *Rhizopoda* which, when in motion, preserve a perpendicular principal axis form monaxonic and amphotect shells of the pylomatic type. Most Thalamophoran shells consist of carbonate of lime, while Radiolarian shells are of silica. DREYER (2).

Reproduction and Development.

PENARD (1) finds that *Ceratium* (a Dinoflagellate) reproduces—(i) by internal embryos; (ii) by cell rejuvenescence, such as *Peridinium* presents; (iii) by fission.

SCHLUMBERGER considers that Brady's observations prove that *Orbitolites complanata* var. *laciniata* is viviparous. The embryos injure the parent in escaping, but the "plasmostracum" is easily repaired.

HERTWIG gives a minute account of observations on conjugating *Paramæcia*. He divides the process of conjugation into four periods, according to the behaviour of the nucleus and parannucleus. He also treats of the fission of *Paramæcia* and the conjugation of *Infusoria* generally.

BERGH describes the part taken by the nuclei and micronuclei in the reproduction of *Urostyla*.

By hardening infested portions of the host, HENNEGUY (1) has succeeded in applying the method of section to the study of the Gregarine of the earthworm. Preparations of the so-called testes of *Lumbricus* taken in May and June give the best results. The author confirms many of the conclusions of previous observers, and describes some new observations with regard to the part played by the nucleus in reproduction. He has not seen the whole contents of the cyst break up into spores, as described by Lieberkühn.

STEDMAN has studied the development of *Actinosphaerium eichornii*. The youngest form observed was a minute mass of protoplasm with vacuole, nucleus and nucleolus. When two such forms came in contact, they simply fused, preserving the vacuoles and nuclei of each. The same phenomenon was observed with regard to larger forms. This process was entirely distinct from the ingestion of food, and seemed to be due to the precise similarity of the protoplasm of the fusing forms. Soon two or three rays appeared. Fission was frequently observed, but the author doubts the existence of endogenous division in the case of this animal.

BEDDARD (1) describes a new Gregarine, and has noticed the following stages in its development:—The animal commences as a spherical mass with one or two long processes, invested by a cuticle, and presenting a distinguishable ecto- and endoplasm. Subsequently oblique ridges appear in the cuticle. The distal end of one of the processes swells, develops a process of its own, and separates off as a new individual. In a third stage the animal presents a multinuclear cyst, and sporulation takes place.

IV.—PHYSIOLOGY.

GRIFFITHS thus established the presence of uric acid in the contractile vacuole:—Amœbæ were placed on a slide, covered with a cover-slip, and treated with alcohol and nitric acid. The slide was gently warmed and ammonia added. Reddish-purple crystals of murexide appeared in some of the contractile vacuoles.

Entodinium and *Isotricha*, found in the paunch of the Roedeer, contained glycogen. CERTES (1).

GARCIN has studied the pigment of *Euglena sanguinea*. It is finely granular, and insoluble in water or cold alcohol. It is soluble in chloroform and in nitric acid, and is turned blue by sulphuric acid. He calls it *rufin*, but it is identical with Rostafinski's *chlororufin*, the colouring matter of *Hamatococcus*, etc.

VERWORN, after describing the spontaneous movement of *Protozoa* with some new observations, relates some experiments on the effects of certain irritants. Light, heat, sound, and electricity were employed, as well as mechanical and chemical stimulants. When a galvanic current is closed through a drop of water, the *Protozoa* always swim towards the kathode, and remain there until the current is broken. The author shows that the house-building habits of *Diffugia urceolata* are no proof of intelligence, but are due to merely mechanical causes.

V.—PALÆONTOLOGY.

BAILEY treats of *Foraminifera* and other minute animals found in the interior of hollow flints.

For Italian *Foraminifera*, see CAPELLINI.

CARTER (1) describes a Foraminifer infesting *Orbitolites mantelli*. See also CARTER (2).

For *Eozoon canadense*, see DAWSON.

DREYER gives several species (1 new) of *Foraminifera* from Gotha.

ELCOCK describes some *Foraminifera* from March.

On pp. 59–61 & 110–118, FRIČ gives a list of *Foraminifera* (none new) from Bohemian Chalk.

For *Foraminifera* from St. Sulpice, see HAÜSLER.

MALAGOLI gives 16 species (none new) of *Foraminifera* from Nirano, near Modena.

SHERBORN & CHAPMAN treat further of the *Foraminifera* of the London Clay. For the *Radiolaria* of the same formation, see SHRUBSOLE.

WOODWARD publishes a preliminary list of 28 species (none new) of Californian *Foraminifera*, found in Post-pleiocene Sand.

VI.—CLASSIFICATION.

MINGAZZINI's observations on Gregarines suggest the following arrangement of the group :—

- A.—One segment only, without distinct test. Individuals isolated, or joined by "apposition" . . . *Monocystidea*.
- B.—Two segments, one cephalic. Individuals isolated, or joined by "opposition" *Polycystidea*.
- C.—Three segments, the anterior cephalic, presenting a more intimate union by opposition *Didymophyidea*.

VII.—GEOGRAPHICAL DISTRIBUTION.

European.

- For *Calcisphaera* in Gloucestershire, see WETHERED.
- BURGESS gives 20 species of *Foraminifera* (none new) dredged at Oban.
- For Irish *Radiolaria*, see KIRKPATRICK.
- SHERBORN & CHAPMAN and SHRUBSOLE treat of the fossil *Protozoa* from the London Clay.
- FABRE-DOMERGUE () describes some *Ciliata* (1 n. g., 2 n. spp.) from Concarneau.
- BENOIST treats of Nummulites from S.W. France.
- HAÜSLER gives an account of *Foraminifera* from St. Sulpice.
- CAPELLINI deals with Italian *Foraminifera*.
- CATTANEO describes some *Protozoa* (none new) taken in Lakes Como and Garda.
- GOURRET & ROESER describe two *Infusoria* from the Port of Bastia.
- MALAGOLI deals with *Foraminifera* from the neighbourhood of Modena.
- DALLA TORRE gives a list of *Protozoa* from Heligoland.
- For some *Foraminifera* from Gotha, see DREYER.
- FRIČ gives a list of Bohemian *Foraminifera*.
- MÖBIUS (1) continues his account of the *Rhizopoda* of Kiel Bay.
- PENARD (3) gives a brief note on *Protozoa* found near Wiesbaden.
- Protozoa* from the Eifel Lakes, ZACHARIAS (1).
- ZACHOKKE gives some *Protozoa* in his Fauna of the mountain lakes Partnum, Tilisuna, and Garshina.

Extra-European.

- BRADY describes a new *Astrorhizid* from the Bay of Bengal.
- For *Protozoa* from Cape Horn, see CERTES.
- MCINTIRE gives a note on the *Cocciidae* of British Guiana.
- SIMMONS describes a species of *Podophrya* from Calcutta ; which, however, he does not name.
- STOKES describes 1 n. g. and 11 n. spp. of freshwater *Peritricha* from the United States.
- For Silurian *Foraminifera* from the I. of Kotelnay, see TOLL.
- WOODWARD treats of the *Foraminifera* of Santa Barbara, California.

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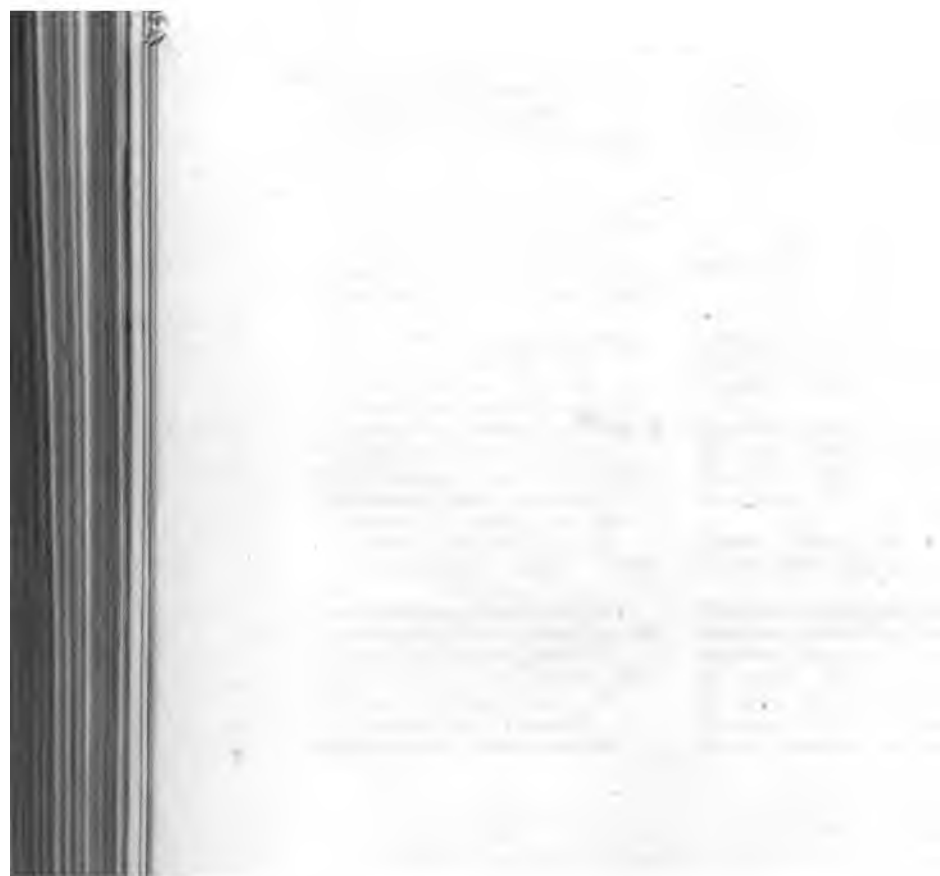
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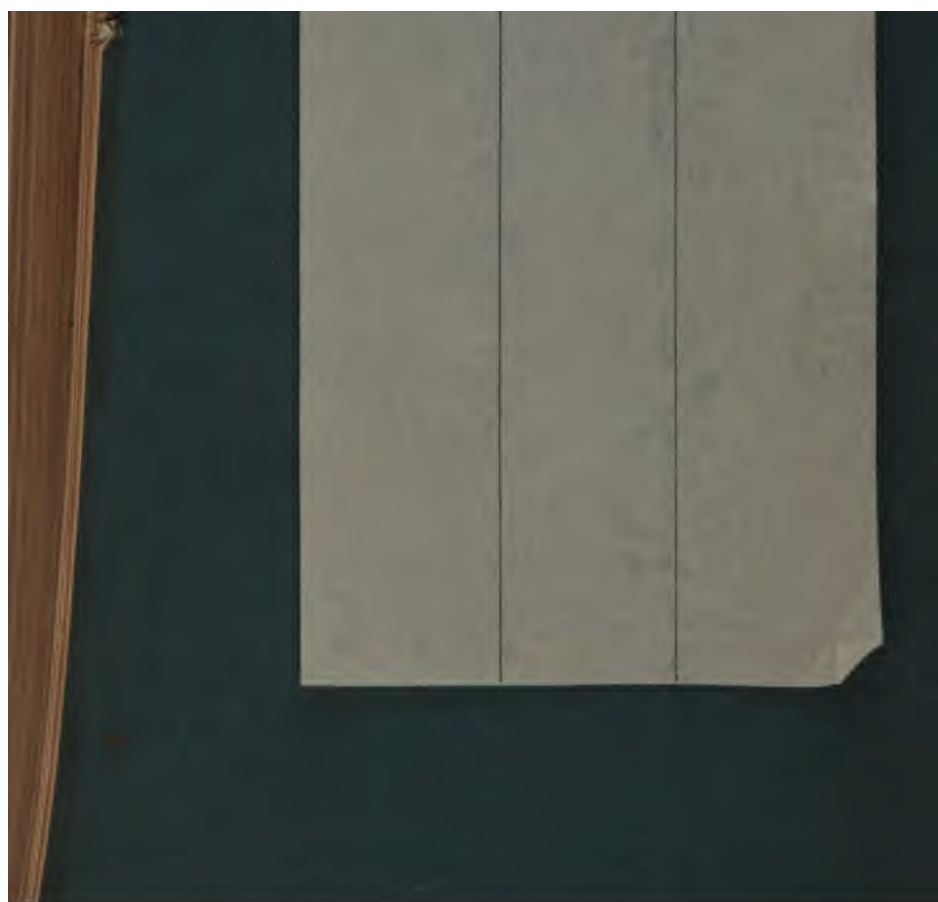
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